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JOURNAL

OF THE

ASIATIC SOCIETY.

No. III. 1863.

On the Flora of Behar and the mountain Parasnath, with a list of the species collected by Messrs. HOOKER, EDGEWORTH, THOMSON and ANDERSON.—By THOMAS ANDERSON, ESQ., M. D. Officiating Superintendent of the Botanic Gardens, Calcutta.

The Botany of Behar, and especially of Parasnath, the highest mountain in the province, has been carefully investigated within the last few years. Dr. Hooker, in 1848, ascended the mountain and made large collections of plants on it as well as along the Grand Trunk Road to the river Soane, and in the Kymore hills. Mr. Edgeworth has also botanized on Parasnath. More recently, Dr. Thomson spent a few days on the hill in September, 1858, and added many species to the number found by Dr. Hooker and Mr. Edgeworth at another season of the year. In November 1858, Dr. Thomson and myself visited Parasnath, remaining eight days at the Jain temple at an elevation of 4000 feet.

We were accompanied by several plant collectors from the Calcutta Botanic Garden, and were thus enabled to make most extensive collections. We also travelled slowly along the Grand Trunk Road, both while going to and when returning from Parasnath, and we thus succeeded in obtaining many plants that had escaped Dr. Thomson's notice at the less favourable season when his previous excursion was made. The following meagre sketch of the Flora of Behar and Parasnath, and the list of species collected in the Province are founded on the results of these botanical investigations. Dr. Hooker has kindly given me a catalogue of all the plants collected by himself

and Mr. Edgeworth on the occasions I have alluded to. This catalogue contains several important identifications of little known and difficult species which it would have been impossible to make without a reference to the Royal Herbarium at Kew.

The dry and hot region of Behar is covered in many parts with rather a thick forest which always acquires more luxuriance in the vicinity of the hills with which the country is studded. In some parts, the vegetation loses its arborescent character and near the Grand Trunk Road, in many places, patches of land of considerable extent are covered with numerous species of grasses. In other parts, especially where the hills are low and less numerous, the trees are scattered over the face of the country giving a park-like appearance to the scenery. These trees belong principally to umbrageous, full foliaged species, among which the commonest are *Bassia latifolia*, *Semecarpus Anacardium*, *Terminalia* and two species of *Urostigma*.

The botanical features of the country from Raneegunge to Parasnath are deserving of a more detailed description.

On the dry sandstone rocks, common near Raneegunge, the dwarf palm, *Phœnix acaulis*, is frequently seen. Along the roadsides, a dusty avenue of stunted trees of *Acacia Farnesiana*, with *Parkiusonia aculeata* extends for some miles. *Phœnix sylvestris* is almost the only tree growing spontaneously in the level uninteresting country about Raneegunge. Tanks, banked up by high bunds of earth covered with thickly planted trees of *Borassus flabelliformis*, (the Palmyra palm) occur near every group of huts. These tanks during many months of the year are nearly dry, but they all contain a large number of interesting aquatic plants, the commonest among which are *Ipomœa reptans*, Poir. *Hydrilla dentata*, Casp. *Vallisneria spiralis*, Linn. *Ottelia alismoides*, DC. and several species of *Potamogeton*, all cosmopolitan. *Sopubia delphinifolia*, G. Don, *Adenosma triflora*, N. ab E. *Hygrophila salicifolia*, N. ab E. and *H. spinosa*, T. Anders. and the aquatic fern *Ceratopteris thalictroides* are seldom absent from the muddy margins of these tanks. Near the bungalow at Asinsole, we observed in November several fields covered with the orange-coloured flowers of *Guizotia oleifera*, cultivated for its oil-yielding seeds. Between Raneegunge and the Barakur, no spontaneous arborescent vegetation occurs, at least near the Grand Trunk Road, but bushes of *Zizyphus*, *Combretum nanum*, Ham. and a subscandent

or prostrate *Tragia* are mingled with stunted semi-spontaneous plants of *Borassus flabelliformis* and *Phœnix sylvestris*.

A short distance beyond the Barakur river, the Grand Trunk Road enters the low jungle which covers a great portion of Behar. *Grislea tomentosa*, Roxb. *Butea frondosa*, Roxb. *Diospyros tomentosa*, Roxb. *Carissa Carandas*, Linn. *Sponia orientalis*, *Baliospermum polyandrum*, Wight. and *Brcidelia spinosa*, Willd. are the most prevalent species in the lower jungle. Where the hills approach the road, as at Gyra, trees of *Vatica robusta* W. and A. *Cochlospermum Gossypium* D. C. *Soymida febrifuga*, Juss. *Terminalia*, *Bassia* and *Symplocos* give a more arborescent character to the vegetation. In the cold season, about November, the slopes of the low hills near Gyra and Topechancee are whitened by the pale floral leaves of *Ichnocarpus frutescens*, R. Br. a climbing plant belonging to the natural order *Apocynaceæ*. During the cold season, the partially dried-up rice-fields yield a rich harvest of rare and peculiar plants among which may be mentioned as most characteristic, five species of *Ammannia*, *Ameletia Indica*, three species of *Utricularia*, and *Burmannia*.

Parasnath rises somewhat abruptly from the plain of Behar to the height of 4,500 feet above the sea. The mass of the mountain is not extensive, but judging from the character of the vegetation on its slopes, the mountain must exert a considerable influence on the amount of moisture in the atmosphere. Accordingly, many species of plants are confined to the mountain and its immediate vicinity probably from their inability to withstand the hot dry climate of the plains and lower hills. The influence of the mountain is shown around the base by the disappearance of the low jungle, its place being taken by large trees of *Dillenia speciosa* and *D. pentagyna*, *Saccopetalum tomentosum*, *Sterculia urens*, *Terminaliæ*, 2 *Myrtaceæ*, *Vatica robusta*, *Rubiaceæ* among which, the most conspicuous are *Nauclea parviflora* and *N. cordifolia*.

A few species of *Ampelideæ*, *Convolvulaceæ*, especially *Porana paniculata* and *Erycibe paniculata*, with *Ichnocarpus frutescens* among *Apocynaceæ*, represent the gigantic climbers of the moist forests of other parts of India. As the sides of the mountain are approached, the forest becomes denser, the trees larger, and the number of species more abundant than around the base, *Terebinthaceæ* and *Leguminosæ* are by far the commonest orders, and of the latter the genera

Dalbergia and *Bauhinia* occur more frequently than any other. Large climbers of Leguminosæ, such as *Pueraria tuberosa*, *Mucuna*, *Canavalia*, *Otosema macrophylla* and *Bauhinia Vahlii*, are most abundant above 2,000 feet elevation. The undergrowth of these forests consists principally of Leguminous shrubs; *Rubiaceæ*; *Compositæ* of the genera *Vernonia* and *Blumea*; *Acanthaceæ* represented principally by *Strobilanthes auriculatus*, *Dædalacanthus purpurascens*, and *Barleria cristata*; *Scrophularinæ* and *Labiata* occur chiefly as inconspicuous herbs. Among *Scrophularinæ*, two species of *Alectra* deserve to be noticed; one of them, a new species, nearly allied to the African one *A. orobanchoides*, *Benth.* occurs in one locality as a lurid, leafless plant, parasitic on the roots of *Strobilanthes auriculatus*.

About 4,000 feet, three species of *Aralia* appear, but they are confined to the cool, dark ravines. From 4,000 feet to the summit, the few species representatives of the subtropical vegetation of the mountain ranges of India are found. These species are *Clematis Gouriana*, and *C. nutans*, *Thalictrum glyphocarpum*, *Berberis Asiatica*, *Geranium Nepalense*, *Pygeum lucidum*, mihi, *Rubia cordifolia*, *Buchnera hispida*, *Habenaria plantaginica* and *H. commelinifolia*, *Disporum* sp. None of these species are numerous enough in individuals to give any character to the vegetation of the summit. *Clematis nutans*, the most tropical of them, is most frequently met with. Of *Pygeum lucidum* only a solitary tree was found on the mountain, on the northern side of the central peak.

The distribution of a few of these species is worthy of notice. *Clematis nutans* is found on the Khasia hills distant, 400 miles from Parasnath, and in Kumaon and Gharwal at a distance of 600 miles.

Thalictrum glyphocarpum is widely distributed over the mountain ranges of India, viz., the Himalaya, Khasia hills, mountains of southern India and Ceylon. In all these ranges, it never occurs below an elevation of 6,000 feet whereas in Parasnath it is met with at 4,000 feet.

The nearest point to Parasnath where *Berberis Asiatica* occurs is the outer ranges of Kumaon and Gharwal, Parasnath being the southern limit of this species.

Geranium Nepalense occurs only on a few grassy spots near the highest peaks of Parasnath and flowers in the cold season, after the 15th

November. This species is found in the Himalayas, the Nilgherries and the mountains of Ceylon. In the Himalayas it flowers in the summer months, and its lower limit is 2,000 feet higher than the summit of Parasnath.

The general resemblance of the Flora of Parasnath to that of the dry less elevated mountain ranges of central and southern India is undoubted. To prove this, the following features of that Flora and of Parasnath are sufficient. The most prominent negative characters of both these Floras are the absence of *Anonaceæ*, *Ternstræmiaceæ*, *Pittosperaceæ*, *Rhamnaceæ* (except *Zizyphus*), *Rosaceæ*, especially tropical *Rubi*, *Araliaceæ*, *Myrsinaceæ*, *Cornaceæ*, *Apocynaceæ*, *Lauraceæ*, *Amentaceæ*, *Aroidæ*, *Orchideæ* and *Ferns*.

The following orders preponderate in both these Floras, but none of them give a definite aspect to the vegetation of these districts.

Sterculiaceæ, *Buettneriaceæ* and *Tiliaceæ* are proportionally numerous both on Parasnath and in central India. To these may be added as quite as prominent in the vegetation, *Olacineæ*; *Terebinthaceæ* especially in number of genera; *Leguminosæ*; *Combretaceæ*, *Lythraceæ*, *Rubiaceæ*, *Compositæ*, especially the genera *Vernonia*, and *Blumea*; *Convolvulaceæ*; *Cordiaceæ* and *Gramineæ*.

The fact of a few peculiar genera and species being common to both these Floras is of more importance as a proof of the affinity of the vegetation of the two regions than deductions drawn from the excess of certain orders. I enumerate the most important of these genera or species which are either identical in species or have representative and allied species in each Flora.

Kydia calycina *Roxb.*, in both.

Cochlospermum Gossypium, *DC.* ditto.

Eriolæna Hookeriana, *W. and A.* ditto.

Olax scandens, *Roxb.*, ditto.

Ougeina dalbergioides, *Benth.*, ditto.

Hardwickia binata, *Roxb.*, ditto.

Dædalacanthus purpurascens, *T. Anders.* ditto.

The following genera are common to both Floras having closely allied species in each.

Pygeum,

Elæodendron,

Zizyphus,

Sophora,
Terminalia,
Cordia,
Ehretia.

Both these lists might be much increased, especially if the geographical distribution in India of the species of Gramineæ was better known.

The following table of the number of species in a few of the larger natural orders will shew how much Leguminosæ and Gramineæ exceed the others. The materials of the entire Flora of Behar are the basis of the tables.

<i>Natural orders.</i>	<i>Genera.</i>	<i>Species.</i>
Leguminosæ,	44	89
Gramineæ,	47	84
Compositæ,	28	47
Rubiaceæ,	16	27
Scrophularineæ,	18	26
Labiataæ,	16	24
Acanthaceæ,	15	23
Euphorbiacæ,	15	23
Cyperacæ,	13	20
Convolvulaceæ,	9	16
Malvaceæ,	6	13
Lythracæ,	6	13
Urticaceæ,	7	11
Orchidaceæ,	8	11
Tiliaceæ,	3	10

The remainder of the Natural Orders have under ten species each.

The total number of species included in this Catalogue is 738 belonging to 473 genera and 110 Natural orders.

These are distributed in the three classes in the following numbers.

	<i>Genera.</i>	<i>Species.</i>
Dicotyledones,	359	560
Monocotyledones,	96	157
Cryptogameæ,	18	21

APPENDIX.

During eight days that Dr. Thomson and I remained at the Jain temple on Parasnath, at an elevation of 4,000 feet a few observations

on the height of the barometer and on the temperature of the air were recorded. I am not aware of any other observations taken during November having been published, I have therefore inserted them at length as they may be useful in comparing the climate of the cold season of Parasnath with that of other periods of the year. The instruments used were a mountain barometer by Newman, a delicate thermometer by the same maker, and a good minimum thermometer.

Record of Barometric and Thermometric Observations.

Date.	Hour.	Barometer.	Thermometer.	Detached Thermometer.	
Nov. 13th	9 P. M. Min.	57°	Air still, sky cloudless.
14th	Ther.	51°	} Gentle northerly breeze all day.
"	10 A. M.	26.222	63°	57.5	
"	2 P. M.	26.149	60°	59°	
"	4 P. M.	26.143	60°	60.5	
"	6 P. M.	26.155	58°	56°	
"	8 P. M.	26.208	58°	52°	} Light clouds & northerly breeze. Light clouds & southerly breeze. Ditto ditto. Ditto ditto.
15th	Min.	...	...	47°
"	8 A. M.	26.222	58°	50°	
"	10 A. M.	26.241	60°	56.5	
"	3 P. M.	26.167	61°	61.5	
"	4 P. M.	25.158	61°	59.5	} Southerly winds, light clouds over the Peak.
"	6 P. M.	26.188	60°	57°	
"	8 P. M.	26.224	59°	56°	
16th	Min.	...	...	52°
"	8 A. M.	26.238	58°	54°	
"	10 A. M.	26.265	60.5	60.5	} Light clouds.
"	2 P. M.	26.203	62°	62°	
"	4 P. M.	26.182	61.5	62°	
"	6 P. M.	26.201	60°	57°	
"	8 P. M.	26.256	60°	56°	
17th	Min.	55°	Wind variable. Slight mist on the summit during night.
"	6 A. M.	56°	} Strong northerly breeze blowing, while a marked upper southerly current of air passed close to the summits of the mountain.
"	8 A. M.	26.282	59°	57°	
"	2 P. M.	26.209	65.5	63.5	
"	4 P. M.	26.200	62°	63°	
"	6 P. M.	26.217	62°	60.5	
"	8 P. M.	26.253	62°	60°	

Catalogue of the plants collected in Behar and on Parasnath.—By
J. M. P. EDGEWORTH, ESQ., DRS. HOOKER, THOMSON, and T.
ANDERSON.

DICOTYLEDONES.

I.—RANUNCULACEÆ.

Naravelia Zeylanica, DC., base of Parasnath.

Clematis Gouriana, Roxb., upper portion of Parasnath.

———— *nutans*, Royle, ditto ditto ditto.

Thalictrum glyphocarpum, W. and A., near the temple on Parasnath.

Ranunculus sceleratus, L.

II.—DILLENIACEÆ.

Dillenia speciosa, Thunb.

———— *pentagyna*, Roxb., base of Parasnath.

III.—ANONACEÆ.

Polyalthia suberosa, H. f. et Benth.

Saccopetalum tomentosum, H. f. et T., base of Parasnath.

IV.—MENISPERMACEÆ.

Tiliacora acuminata, Miers.

Cocculus villosus, DC.

Stephania hernandifolia, Walp.

Cissampelos Pareira, L.

V.—BERBERIDACEÆ.

Berberis Asiatica, Roxb., summit of Parasnath.

VI.—NYMPHÆACEÆ.

Nymphæa Lotus, L.

———— *stellata*, Willd.

VII.—NELUMBIACEÆ.

Nelumbium speciosum, Willd.

VIII.—PAPAVERACEÆ.

Papaver somniferum, L.

Argemone Mexicana, L.

IX.—FUMARIACEÆ.

Fumaria parviflora, Lam.

X.—CRUCIFERÆ.

Nasturtium Indicum, L.

———— *Benghalense*, DC.

Cochlearia flava, *Ham.*, banks of the Soane.

Thlaspi arvense, *L.*

Lepidium sativum, *L.*

Sinapis juncea, *L.*

Brassica campestris, *L.*

XI.—CAPPARIDACEÆ.

Cleome monophylla, *L.*

———— *pentaphylla*, *L.*

Polanisia viscosa, *DC.*

Capparis horrida, *L.*

XII.—FLACOURTIACEÆ.

Flacourtia sepiaria, *Roxb.*

———— *sapida*, *Roxb.*

———— *cataphracta*, *Roxb.*

Casearia Hamiltonii, *Wall.*

———— *tomentosa*, *Roxb.*

Cochlospermum Gossypium, *DC.*, Grand Trunk Road and base of Parasnath.

XIII.—POLYGALACEÆ.

Salomonina oblongifolia, *DC.*

Polygala glaucescens, *Wall.*, summit of Parasnath.

———— *oligophylla*, *DC.*

———— *arvensis*, *Willd.*

XIV.—VIOLACEÆ

Ionidium suffruticosum, *Ging.*

XV.—DROSERACEÆ.

Drosera indica, *L.*, summit of Parasnath.

XVI.—TAMARICACEÆ.

Trichaurus ericoides, *W. & A.*

XVII.—CARYOPHYLLACEÆ.

Vaccaria parviflora, *Moench.*

Mollugo Cerviana, *Ser.*

———— *striata*, *L.*

———— *triphylla*, *Lam.*

Polycarpæa corymbosa, *Lam.*

Hapalosia Lœflingiae, *Wall.*

Drymaria cordata.

XVIII.—LINACEÆ.

Linum usitatissimum, *L.*

Reinwardtia trigyna, *Planch.*, base of Parasnath.

XIX.—MALVACEÆ.

Abutilon Indicum, *Don.*

Sida cordifolia, *L.*

—— *humilis*, *Willd.*

—— *rhombofolia*, *L.*

—— *acuta*, *L.*

Abelmoschus moschatus, *Moench.*

———— *cancellatus*, *Roxb.*

Hibiscus Lampas, *Cav.*

———— *rigidus*, *L.*

Urena lobata, *L.*

———— *repanda*, *Sm.*, Grand Trunk Road.

———— *sinuata*, *L.*, ditto ditto ditto.

Lagunea lobata, *Willd.*, ditto ditto ditto,

XX.—STERCULIACEÆ.

Salmalia malabarica, *Schott & Endl.*

Helicteres Isora, *L.*, base of Parasnath.

Sterculia foetida, *L.*, lower forests of Parasnath.

———— *urens*, *Roxb.*, ditto ditto ditto.

Firmiana colorata, *R. Br.*, ditto ditto ditto.

Melochia corchorifolia, *L.*, Grand Trunk Road.

Waltheria Indica, *L.*

Kydia calycina, *Roxb.*, Parasnath to 4,000 feet.

XXI.—BYTTNERIACEÆ.

Byttneria herbacea, *Roxb.*, Gyra.

Eriolœna Hookeriana, *W. & A.*, summit of Parasuath,

———— *spectabilis*, *Planch.*

XXII.—TILIACEÆ.

Corechorus capsularis, *L.*

———— *acutangulus*, *Lam.*

———— *olitorius*, *L.*

Triumfetta pilosa, *Roth.* ?

———— *angulata*, *Lam.*

Grewia pilosa, *Lam.*, summit of Parasnath.

———— *laevigata*, *Fahl.*, Grand Trunk Road.

Grewia helicterifolia, *Wall.*

—— *Asiatica*, *L.*, Grand Trunk Road and Parasnath.

—— *vestita*, *Wall.* ? summit of Parasnath.

XXIII.—DIPTEROCARPEÆ.

Vatica robusta, *W. & A.*, Grand Trunk Road.

XXIV.—OLACINÆÆ.

Olax scandens, *Roxb.*, base of Parasnath.

Balanites *Roxburghi*, *R. & S.*

XXV.—AURANTIACEÆ.

Glycosmis pentaphylla, *DC.*, Parasnath.

Murraya exotica, *L.*

Feronia elephantum, *Corr.*

Ægle marmelos, *Corr.*

XXVI.—MALPIGHIACEÆ.

Hiptage madablota, *Gærtn.*

XXVII.—SAPINDACEÆ.

Cardiospermum Halicacabum, *L.*

Nephelium duriocarpus, *Lour.*

Schleichera trijuga, *Willd.*, lower forests of Parasnath.

XXVIII.—MELIACEÆ.

Melia Azedarach, *L.*

Azadirachta Indica, *Adr. Juss.*, base of Parasnath.

Mallea Rothii, *Adr. Juss.*, summit of Parasnath.

XXIX.—CEDRELACEÆ.

Chickrassia tabularis, *Adr. Juss.*, Parasnath, from base to summit.

Soymida febrifuga, *Juss.*

XXX.—AMPELIDÆÆ.

Leea staphylea, *Roxb.*

Vitis adnata, *Wall.* ?

—— *carnosa*, *Wall.*

—— *latifolia*, *Roxb.*

—— *tomentosa*, *Heyne.*

} Base and lower forests of Parasnath.

XXXI.—GERANIACEÆ.

Geranium Nepalense, *Sweet.*, summit of Parasnath.

XXXII.—OXALIDÆÆ.

Oxalis corniculata, *L.*

Biophytum sensitivum, *DC.*, base of Parasnath.

XXXIII.—BALSAMINEÆ.

Impatiens Balsamina, *L.*, upper forests of Parasnath.

XXXIV.—ZYGOPHYLLACEÆ.

Tribulus terrestris, *L.*

XXXV.—CELASTRINEÆ.

Celastrus paniculata, *Willd.*

———— *emarginata*, *Willd.*

Elæodendron Roxburghii, *W. & A.*

XXXVI.—RHAMNACEÆ.

Zizyphus rugosa, *Lam.*, upper forests of Parasnath.

———— *Xylopyra*, *Willd.* ?? base of Parasnath.

———— *Lotus*, *Lam.*

———— *Jujuba*, *Lam.* ? } Grand Trunk Road.

———— *Cenopila*, *Mill.*

Ventilago maderaspatana, *Gaertn.*

Catha edulis, *Försk.* ?? Grand Trunk Road.

XXXVII.—TEREBINTHACEÆ.

Mangifera Indica, *L.*, below the temple on Parasnath.

Semecarpus Anacardium, *L.*

Buchanania latifolia, *Roxb.*, base of Parasnath and Trunk Road.

Iceia Indica, *W. & A.*

Garuga pinnata, *Roxb.* } base of Parasnath.

Odina Wodier, *Roxb.*

Boswellia thurifera, *Colebr.*

XXXVIII.—MORINGACEÆ.

Moringa pterygosperma, *Gaertn.*

XXXIX.—LEGUMINOSÆ.

Crotalaria prostrata, *Roxb.*

———— *acicularis*, *Ham.*, near Topechance.

———— *alata*, *Roxb.*

———— *sericea*, *Retz.*

———— *verrucosa*, *L.*

———— *juncea*, *L.*

———— *albida*, *Heyne.*

Indigofera linifolia, *Retz.*

———— *pentaphylla*, *L.* } Grand Trunk Road.

———— *hirsuta*, *L.*

———— *pulchella*, *Roxb.*, from 2,000 feet elevation to summit of Parasnath.

Indigofera trita, *L.*

Psoralia corylifolia, *L.*

Sesbania ægyptiaca, *L.*

Tephrosia purpurea, *Pers.*

Lathyrus sativa, *L.*

Smithia sensitiva, *Ait.*

—— *ciliata*, *Royle.*, summit of Parasnath.

—— *conferta*, *Sm.*

Zornia angustifolia, *Sm.*

Æschynomene Indica, *L.*

Ougenia dalbergioides, *Benth.*, summit of Parasnath.

Alysicarpus vaginalis, *DC.*

—— *nummularifolius*, *DC.*

—— *bupleurifolius*, *DC.*

—— *scariosus*, *Grah.*

Uraria lagopoides, *DC.*

—— *hamosa*, *Wall.*

? *styracifolia*, *W. & A.*

} Along the Grand Trunk Road.

Dendrolobium cephalotis, *Benth.*

Desmodium triflorum, *DC.*, Grand Trunk Road.

—— *polycarpum*, *DC.*, from the base to summit of Parasnath.

—— *gyrans*, *DC.*

—— *latifolium*, *DC.*, from the base to 2,000 feet on Parasnath.

—— *diffusum*, *DC.*, lower forests of Parasnath.

—— *gangeticum*, *DC.*, on Parasnath.

—— *retroflexum*, *DC.*, Var.

Phyllodium pulchellum, *Ders.*, base of Parasnath.

Dumasia eongesta, *Grah.*

Pueraria tuberosa, *DC.*

Alhagi maurorum, *L.*, Grand Trunk Road.

Glycine labialis, *W. & A.*, base of Parasnath.

Canavalia gladiata, *DC.*

Mucuna pruriens, *Wall.*

Erythrina Indica, *Lam.*

—— *sublobata*, *Roxb.*

Butea frondosa, *Roxb.*

Butca parviflora, *Roxb.*

Lablab vulgaris, *Savi.*

Phaseolus sublobatus, *Roxb.*

———— *sp. proxima* *P. alato*, *Roxb.*, Parasnath.

Atylosia scarabæoides, *Benth.*, Grand Trunk Road.

Rhynchosia minima, *DC.*

Flemingia strobilifera, *R. Br.*, Parasnath.

———— *semialata*, *Roxb.*

———— *angustifolia*, *Roxb.*, Parasnath.

———— *cordifolia*, *Wall.*

Abrus precatorius, *L.*

Otosema macrophylla, *Benth.*

Pongamia glabra, *Vent.*

Dalbergia latifolia, *Roxb.*

———— *Sissoo*, *Roxb.*

———— *frondosa*, *Roxb.*

———— *paniculata*, *Roxb.*

———— *confertiflora*,

Sophora heptaphylla, *L. ? ?*

Guilandina bonducella, *L.*

Mezoneuron cucculatum.

Cassia occidentalis, *L.*

———— *tora*, *L.*

———— *mimosoides*, *L.*

Tamarindus Indica, *L.*

Phanera purpurea, *Benth.*

———— *variegata*, *Benth.*

———— *retusa*, *Benth.*

———— *Vahlii*, *Benth.*

Piliostigma malabaricum, *Benth.*

———— *racemosum*, *Benth.*

Hardwickia binata, *Roxb.*, upper Soane valley.

Adenanthera Pavonina, *L.*

Mimosa rubicaulis, *Lam.*

Acacia Farnesiana, *Willd.*

———— *Catechu*, *Willd.*

———— *cæsia*, *W. & A.*

———— *pennata*, *Willd.*

Albizzia odoratissima, *Benth.*

———— *amara*, *Bois.*

———— *procera*, *Benth.*

XL.—ROSACEÆ.

Potentilla supina, L. banks of the Soane.

Pygeum lucidum, T. Anders., MSS., summit of Parasnath at 4,300 feet elevation.

XLI.—COMBRETACEÆ.

Conocarpus latifolia, *Roxb.*

Terminalia belerica, *Roxb.*

———— *chebula*, *Roxb.*

———— *Catappa*.

———— *citrina*, *Roxb.*

Pentaptera tomentosa.

———— *Arjuna*, *Roxb.* ?

Poivrea Roxburghii, *DC.*

Combretum nanum, *Ham.*, Grand Trunk Road.

XLII.—MELASTOMACEÆ.

Osbeckia angustifolia, *Don.*, summit of Parasnath.

———— *muralis* *Naud*, ditto ditto.

XLIII.—ALANGIACEÆ.

Alangium decapetalum, *Lam.*, Grand Trunk Road.

XLIV.—MYRTACEÆ.

Eugenia Jambolana, *Lam.*, Parasnath from the base to the summit.

———— *sp.* summit of Parasnath.

Barringtonia acutangula, *Roxb.*

XLV.—LYTHRACEÆ.

Jussiaea repens, *L.*

———— *villosa*, *Lam.*

———— *angustifolia*, *Lam.*

Ludwigia parviflora, *Roxb.*

} From the base of Parasnath to an
elevation of 4,000 feet in wet places
near the Grand Trunk Road.

Grislea tomentosa, *Roxb.*, Grand Trunk Road & base of Parasnath.

Lagerstromia parviflora, *Roxb.*, base of Parasnath.

- | | |
|----------------------------------------|---------------------------------------------------------------|
| <i>Ameletia Indica</i> , <i>DC.</i> | } In rice fields near the Grand
Trunk Road at Topechancee. |
| ———— <i>tenuis</i> , <i>Wt.</i> | |
| <i>Ammannia glauca</i> , <i>Wall.</i> | |
| ———— <i>vesicatoria</i> , <i>Roxb.</i> | |
| ———— <i>multiflora</i> , <i>Roxb.</i> | |
| ———— <i>pentandra</i> , <i>Roxb.</i> | } |
| ———— <i>rotundifolia</i> , <i>Ham.</i> | |

XLVI.—CUCURBITACEÆ.

- Trichosanthes dioica*, *Roxb.*
 ————— *cucumerina*, *L.*, base of Parasnath.
Bryonia scabrella, *L.*
 ————— *umbellata*, *Koen.*, summit of Parasnath.
 ————— *laciniosa*, *L.*, on the Grand Trunk Road.
Coccinia Indica, *W. & A.*

XLVII.—CRASSULACEÆ.

- Kalanchoë floribunda*, *W. & A.*, summit of Parasnath.
Bryophyllum calycinum, *Salisb.*

XLVIII.—UMBELLIFERÆ.

- Umbellifera* (undeterminable,) summit of Parasnath.

XLIX.—ARALIACEÆ.

- Aralia digitata*, *Roxb.*, summit of Parasnath.
 ————— sp., on Parasnath at 4,000 feet elevation.
 ————— sp., on Parasnath at 2,000 feet elevation.

L.—LORANTHACEÆ.

- Viscum orientale*, *Willd.* }
 ————— *attenuatum*, *DC.* } at the base of Parasnath.
Loranthus buddleoides, *W. & A.*, from the base to the summit
 of Parasnath.
 ————— *bicolor*, *Roxb.*, base of Parasnath.

LI.—RUBIACEÆ.

- Nauclea parviflora*, *Roxb.*, }
 ————— *cordifolia*, *Roxb.*, } forests on the base of Parasnath.
Hymenodyction excelsum, *Wall.*, on Parasnath at 2,000 feet elevation.
Gardenia latifolia, *Ait.* }
 ————— *campanulata*, *Roxb.* }
 ————— *turgida*, *Roxb.* } base of Parasnath.
 ————— *montana*, *Roxb.* }

Randia longispina, DC.

——— *uliginosa*, DC.

Wendlandia tinctoria, DC.

——— *exserta*, DC.

Dentella repens, Forst., moist places on the Grand Trunk Road.

Hedyotis scandens, Roxb.

——— *calycina*, Wall.

——— *pinifolia*, Wall.

Oldenlandia racemosa, Lam.

——— *Burmanniana*, R. Br.

Vanquæria spinosa, Roxb., base of Parasnath.

Hamiltonia suaveolens, Roxb., summit of Parasnath.

Ixora undulata, Roxb., forests at the base of Parasnath.

——— *parviflora*, Vahl., near Gya on the Grand Trunk Road.

Pavetta tomentosa, Sm., at the base of Parasnath.

Bigelowia lasiocarpa, W. & A., from the base to the summit of Parasnath.

Spermacoce articularis, L.

Knoxia cosymbosa, Willd.

——— n. sp.

Rubia cordifolia, L., on Parasnath.

LII.—COMPOSITÆ.

Vernonia saligna, DC., on Parasnath (found only by Dr. Hooker.)

——— *rigiophylla*, DC., at the base of Parasnath.

——— *divergens*, H. f. et. T., near the summit of Parasnath.

——— *aspera*, DC.

——— *cinerea*, Less.

——— *anthelmintica*, Willd.

Elephantopus scaber, L.

Adenostemma latifolium, DC., summit of Parasnath.

Sphæranthus hirtus, Willd.

Grangea Madraspatana, Poir.

Cyathocline lyrata, Cass.

Conyza viscidula, Wall.

——— *veronicæfolia*, DC.

Blumea amplexans, DC.

——— *Wightiana*, DC.

——— *lacera*, DC.

Blumea runcinata, *DC.*

———— *virens*, *DC.*

———— *flava*, *DC.*

———— *aurita*, *DC.*

———— *oxyodonta*, *DC.*

———— *glomerata*, *DC.*

———— *alata*, *DC.*

Vicoa Indica, *Wt.*

Franeœuria crispa, *Cass.*

Cæsulia axillaris, *Roxb.*

Eclipta alba, *Hassk.*

Blainvillea latifolia, *DC.*

Glossocardia Boswellii, *DC.*

Bidens pilosa, *L.*

———— *bipinnata*, *L.*

Glossogyne pinnatifida, *DC.*

Wedelia urticæfolia, *DC.*

Siegesbeckia orientalis, *L.*

Myriœgyne minuta, *DC.*

Artemisia parviflora, *Roxb.*

Senecio sp. not determinable, summit of Parasnath.

Gnaphalium luteo-album, *L.*

———— *crispatum*, *Del.*

———— *indicum*, *L.*

Emelia sonchifolia, *DC.*

Sonchus arvensis, *L.*

Youngia runcinata, *DC.*

Echinops echinatus, *Roxb.*

Tricholepis Candolleana, *Wt.*

Microrhynchus ruderalis, *Less.*

———— *asplenifolius*, *DC.*

LIII.—CAMPANULLACEÆ.

Cephalostigma hirsutum, *A. DC.*

———— *paniculatum*, *A. DC.*

Campanula canescens, *Wall.*

Wahlenbergia agrestis, *A. DC.*

Lobelia trigona, *Roxb.*

Micropyxis pumila, *Duby.*, summit of Parasnath.

LIV.—MYRSINACEÆ.

Embelia robusta, *Roxb.*, lower forests to the summit of Parasnath.
Ardisia humilis, *Vahl.*, ditto ditto ditto.

LV.—EBENACEÆ.

Diospyros tomentosa, *Roxb.*
 ——— *cordifolia*, *Roxb.*
 ——— *exculpta*, *Ham.*

LVI.—SAPOTACEÆ.

Bassia butyracea, *Roxb.*

LVII.—JASMINACEÆ.

Nyctanthes arbor-tristis, *L.*, lower forests of Parasnath.

LVIII.—OLEACEÆ.

Olea Roxburghii, *R. & S.*, summit of Parasnath.

LIX.—STYRACACEÆ.

Symplocos Hamiltonianus, *Herb. Strach. et Winter*, Gyr.

LX.—APOCYNACEÆ.

Carissa Carandas, *L.*
Vallaris dichotoma, *Vahl.*
Wrightia tomentosa, *DC.*, at the base of Parasnath.
Holarrhena antidysenterica, *Wall.*
Ichnocarpus frutescens, *R. Br.*
Vinca pusilla, *Murr.* Gyr on the Grand Trunk Road.

LXI.—ASCLEPIADACEÆ.

Hemidesmus Indicus, *R. Br.*
Cryptolepis Buchananii, *R. et S.*
Cynoctonum Callialata, *Dene.*, at the summit of Parasnath.
Calotropis gigantea, *R. Br.*
Asclepias curassavica, *L.*
Gymnema hirsutum, *W. & A.*
Hoya pendula, *W. & A.*, from the base to 3,500 feet on Parasnath.
Ceropegia sp. undeterminable, summit of Parasnath.

LXII.—LOGANIACEÆ.

Strychnos potatorum, *L. fil.*

LXIII.—GENTIANACEÆ.

Exacum pedunculatum, *L.*
 ——— *petiolare Grieseb.*, summit of Parasnath.
Pladera pusilla, *Roxb.*

Canscora diffusa, *R. Br.*

———— *decussata*, *R. et S.*

LXIV.—BIGNONIACEÆ.

Heterophragma Roxburghii, *DC.*? Forest at the base of Parasnath.

Stereospermum chelonoides, *DC.*? Forest at the base of Parasnath.

Schrebera Swietenoides, *Roxb.*

LXV.—PEDALIACEÆ.

Sesamum Indicum, *L.*

Martynia diandra, *Glox.*

LXVI.—CYRTANDRACEÆ.

Æschynanthus, *sp.*, summit of Parasnath.

Rhynchoglossum obliquum, *DC.*, summit of Parasnath.

LXVII.—HYDROPHYLLACEÆ.

Hydrolea Zeylanica, *Vahl.*, along the Grand Trunk Road.

Sphenoclea Zeylanica, *L.*

LXVIII.—CONVOLVULACEÆ.

Rivea hypocrateriformis, *Chois.*

———— *Bona Nox*, *Chois.*

Argyreia setosa, *Chois.*

Pharbitis Nil, *Chois.*, summit of Parasnath.

Ipomœa reptans, *Poir.*

———— *reniformis*, *Chois.*

———— *tridentata*, *Roth.* Gyra.

———— *pestigridis*, *L.*

———— *sessiliflora*, *Roth.*

———— *obscura*, *Kerr.*

———— *sepiaria*, *Kæn.*, Topechancee.

Convolvulus pluricaulis, *Chois.*

Porana paniculata, *Roxb.*, on Parasnath to an elevation of 2,000 feet.

Evolvulus alsinoides, *L.*

Erycibe paniculata, *Roxb.*

Cuscuta reflexa, *Roxb.*

LXIX.—CORDIACEÆ.

Cordia polygama, *Roxb.*?

———— *sp.* (an *C. Macleodii* *H. f. et T.*) Gyra.

Ehretia laevis, *Roxb.*

——— *ovalifolia*, *Wight.*

——— *viminea*, *Wall.*

LXX.—BORRAGINÆÆ.

Coldenia procumbens, *L.*

Bothriospermum tenellum, *Fisch et Mey.*

Cynoglossum micranthum, *Desf.*, from 2,000 feet to the summit of Parasnath.

Trichodesma Indicum, *R. Br.*

——— *Zeylanicum*, *R. Br.*

LXXI.—SOLANACEÆ.

Solanum Xanthocarpum, *Schrad.*

——— *torvum*, *Swartz.*

LXXII.—SCROPHULARINÆÆ.

Celsia coromandeliana, *Vahl.*

Linaria ramosissima, *Wall.*

Alectra Indica, *Bth.*, towards the summit of Parasnath.

——— *squamosa*, *T. Anders. MSS.*, from 1—3,000 feet elevation on Parasnath. Parasitic on roots of *Strobilanthes auriculatus*.

Mazus rugosus, *Lour.*

Lindenbergia urticæfolia, *Lehm.*, Parasnath to 4,000 feet elevation,

Limnophila gratioloides, *R. Br.*

Herpestes Hamiltoniana, *Benth.*, Topechancee.

——— *Monniera*, *H. B. K.*

Torenia cordifolia, *Roxb.* } Grassy places on the summit of Paras-
——— *sp. (an nova.)* } nath.

Vandellia crustacea, *Bth.*

——— *erecta*, *Bth.*

——— *nummularifolia*, *Don.*

Ilysanthes parviflora, *Bth.*

Bonnaya brachiata, *Link., et Otto.*

——— *veronicaefolia*, *Spreng.*

——— *verbenæfolia*, *Spreng.*

Glossostigma spathulatum, *Arn.*

Scoparia dulcis, *L.*

Buddleia asiatica, *Lour.*

Buchnera hispida, *Ham.*, above 4,000 feet on Parasnath.

Striga euphrasioides, *Bth.*

Sopubia delphinifolia, *G. Don.*, in pools of water along the Grand Trunk Road.

Centranthera hispida, *R. Br.*

————— *humifusa*, *Wall.*

LXXIII.—OROBANCHACEÆ.

Phelipæa Indica, *G. Don.*

Æginetia Indica, *Roxb.*

LXXIV.—LENTIBULARIACEÆ.

Utricularia stellaris, *L.*

————— sp.

————— sp.

} In a marshy place near Gyra.

LXXV.—ACANTHACEÆ.

Nelsonia tomentosa, *Willd.*

Adenosma triflora, *N. ab E.*

Hygrophila salicifolia, *N. ab E.*

————— *spinosa* *T. Anders.*

Ruellia cernua, *Roxb.*, lower forests of Parasnath.

Petalidium barlerioides, *N. ab E.*, base of Parasnath.

Hemiographis elegans, *N. ab E.*

Strobilanthes auriculatus, *N. ab E.*

Dædalacanthus purpurascens, *T. Anders.* from the base to the summit of Parasnath.

Barleria cœrulea, *Roxb.*

————— *cristata*, *L.*

Lepidagathis hyalina, *N. ab E.*

————— *cristata*, *Willd.*, along the Grand Trunk Road.

————— *striata*, *N. ab E.*

Andrographis paniculata, *N. ab E.*

————— *echioides*, *N. ab E.*

Justicia Adhatoda, *L.*

————— *Betonica*, *L.*

————— *procumbens*, *L.*

Peristrophe bicalyculata, *N. ab E.*

Rungia parviflora, *N. ab E.*

Dicliptera bupleuroides, *N. ab E.?*

————— *micrantha*, *N. ab E.*, Topechancee.

LXXVI.—VERBENACEÆ.

Callicarpa arborea, *Roxb.*, lower forests of Parasnath.

Clerodendron serratum, *Spreng.*, at the base of Parasnath.

————— *infortunatum*, *L.*

Vitex Negundo, *L.*, Gya.

————— *peduncularis*, *Wall.*, at the base of Parasnath.

LXXVII.—LABIATÆ.

Ocimum Basilicum, *L.*

Acrocephalus capitatus, *Benth.*

Orthosiphon rubicundus, *Benth.*, Topechancee.

Plectranthus ternifolius, *Don.*

————— *cordifolius*, *Don.*

Coleus barbatus, *Benth.*

Anisochilus carnosus, *Wall.*

————— *eriocephalus*, *Benth.*, Kymore hills *J. D. Hooker.*

Pogostemon plectranthoides, *Desf.*

Dysophylla verticellata, *Benth.*

Colebrookia oppositifolia, *Smith.*

Calamintha umbrosa, *Benth.*?

Nepeta ruderalis, *Hamilt.*

Anisomeles ovata, *R. Br.*, summit of Parasnath.

Leucas lanata, *Benth.*

————— *mollissima*, *Wall.*

————— *pilosa*, *Benth.*

————— *aspera*, *Spreng.*

————— *nutans*, *Spreng.*

————— *cephalotes*, *Spreng.*

————— *linifolia* *Spreng.*

Leonotis nepetæfolia, *R. Br.*

Teucrium decumbens.

Ajuga macrosperma, *Wall.*? summit of Parasnath.

LXXVIII.—PLUMBAGINACEÆ.

Plumbago Zeylanica, *L.*

LXXIX.—LAURACEÆ.

Cassytha filiformis, *L.* along the Grand Trunk Road.

Tetranthera (an *T. apetala*.)

LXXX.—POLYGONACEÆ.

Rumex dentatus, *Campd.*

————— *vesicarius*, *L.*

Polygonum herniarioides, *Delile.*

Polygonum glabrum, Willd.

———— chinense, *L.*, from the base to the summit of Parasnath.

———— Roxburghii, *Meisn.*

———— flaccidum, *Roxb.*, on Parasnath at elevation 4000 feet.

———— barbatum, *L.*, Gyra and Topechancee.

———— Nepalense, *Meisn.*, towards the summit of Parasnath.

LXXXI.—CHENOPODIACEÆ.

Chenopodium album, *L.*

LXXXII.—AMARANTACEÆ.

Derringia celosioides, *R. Br.*

Celosia argentea, *L.*

Amarantus spinosus, *L.*

Ærva scandens, *Wall.*, on Parasnath at 4000 feet elevation.

———— lanata, *Juss.*

Achyranthes aspera, *L.*

———— bidentata, *Blume.*, from the base to the summit of Parasnath.

Pupalia lappacea, *Moq.*

Alternanthera sessilis, *R. Br.*

LXXXIII.—NYCTAGINEÆ.

Boerhaavia diffusa, *L.*

LXXXIV.—PIPERACEÆ.

Peperomia reflexa, *A. Dietr.* on trees at 4000 feet elevation on Parasnath.

LXXXV.—STILAGINACEÆ.

Antidesma diandrum, *Spreng.*

———— paniculatum, *Spreng.*

LXXXVI.—SCEPACEÆ.

Lepidostachys Roxburghii, *Wall.*

LXXXVII.—URTICACEÆ.

Trophis aspera, *Willd.*

Urtica heterophylla, *Roxb.*

Bhœmeria, sp., on Parasnath.

Urostigma religiosum, *Guss.*

———— bengalense, *Guss.*

———— tomentosa, *Guss.*

———— comosum, at 2,500 feet elevation on the Northern slope of Parasnath.

Ficus parasitica, *Koen.*

——— *scandens*, *Roxb.*

Covellia cunea, *Miq.*

Artocarpus Lacucha, *Roxb.*

LXXXVIII.—ULMACEÆ.

Sponia orientalis, *Endl.*

Ulmus integrifolia, *Roxb.*

LXXXIX.—EUPHORBIACEÆ.

Euphorbia chamæsyce, *Willd.*

——— *Indica*, *Lam.*

——— *Nivulia*, *Ham.*

——— *uniflora*, *Roxb.*

Microstachys chamelea, *Juss.*

Tragia, along the Grand Trunk Road.

Acalypha Indica, *Willd.*, (fid. Edgew.)

Baliospermum polyandrum, *Wight.*

Rottlera tinctoria, *Roxb.*

Trewia nudiflora, *Linn.*

Croton oblongifolia, *Roxb.*

Crozophora Rottleri, *Juss.*

Embllica officinalis, *Gært.*

Phyllanthus urinarius, *Willd.*

——— *simplex*, *Willd.*

——— *Niruri*, *Linn.*

——— *polyphyllus*, *Wight.*

Anisonema multiflorum, *Wight.*

Bradleia (52 herb. Hook. et cat.)

Briedelia montana, *Willd.*

——— *spinosa*, *Willd.*

——— No. 16 herb Hook. et cat.

Melanthesa Vitis idæa, *Koen.*

MONOCOTYLEDONES.

XC.—PALMEÆ.

Phoenix sylvestris, *Roxb.*

——— *acaulis*, *Roxb.*

Borassus flabelliformis, *Linn.*

XCI.—AROIDEÆ.

Remusatia vivipara, *Schott.*

XCII.—Najadee.

Najas minor, *All.*

Zanichellia palustris, *Linn.*

XCIII.—Juncaginee.

Potamogeton natans, *Linn.*

————— *hybridus*, *Mx.*

————— *crispus*, *Linn.*

————— *pectinatus*, *Linn.*

XCIV.—Hydrocharidee.

Hydrilla dentata, *Casp.*

Vallisneria spiralis, *Linn.*

Ottelia alismoides, *DC.*

XCV.—Scitaminee.

Globba bulbifera.

Zingiber capitatum, *Roxb.?*

————— *roseum*, *Roxb.?*

————— *cassumunar*, *Roxb.?*

Alpinia, *sp.*

Curcuma, *sp.*

XCVI.—Orchidee.

Oberonia, *sp.*, on rocks near the summit of Parasnath, J. D. Hooker.

Malaxis Walkeriana, *Grah.?*

Dendrobium ramosissimum, *Wight.*, near the summit of Parasnath.

————— *sp.*, undetermined.

Vanda Roxburghii, *R. Br.*

Eulophia graminea, *Lindl.*

Calanthe, *sp.*

Habenaria plantaginea, *Lindl.*

————— *- commelinifolia*, *Wall.*

————— *- sp.*

} towards the upper part of
Parasnath,

Zeuxine sulcata, *Lindl.*

XCVII.—Burmanniacee.

Burmannia, *sp.*, near Gyra on the Grand Trunk Road,

XCVIII.—Hypoxidee.

Curciligo recurvata, *Don.*

————— *orchidoides*, *Gaertn.*

Hypoxis minor, *Don.*

XCIX.—Dioscoridee.

Dioscorea glabra, *Roxb.*

C.—LILIACEÆ.

- Smilax ovalifolia*, *Roxb.*
Iphigenia indica, *Kunth.*
Asphodelus fistulosus, *Linn.*
Chlorophytum attenuatum, *Wight.*
Asparagus racemosus, *Roxb.*

CI.—MELANTHACEÆ.

- Disporum Leschenaultianum*, *Don.*

CII.—COMMELYNACEÆ.

- Commelyna salicifolia*, *Roxb.*
 ———— *communis*, *Linn.*
 ———— *benghalensis*, *Linn.*
Aneilema nudiflorum, *R. Br.*
 ———— *nana*, *Kunth*
 ———— *latifolia*, *Wight.*
 ———— *vaginata*, *Wall.*
Cyanotis cristata, *R. & S.*

CIII.—JUNCACEÆ.

- Juncus Leschenaultii*, *J. Gay.*

CIV.—RESTIACEÆ,

- Eriocaulon trilobum*, *Ham.*

CV.—CYPERACEÆ,

- Papyrus Pangorei*, *Rottb.*
Cyperus flavescens, *Linn.*
 ———— *umbellatus*, *Benth.*
 ———— *pygmaeus*, *Vahl.*
 ———— *difformis*, *Linn.*
Lipocarpa lævigata, *N. ab E.*
Hermicarpha Isolepis, *N. ab E.*
Fimbristylis pallescens, *N. ab E.*
Trichelostylis scabra, *N. ab E.*
 ———— *junciformis*, *N. ab E.*
Isolepis squarrosa, *Vahl*
 ———— *supina*, *R. Br.*
 ———— *prolongata*, *N. ab E.*
 ———— *trifida*, *N. ab E.*
Scirpus affinis, *Rottb.*
 ———— *capitatus*, *Willd.*
Fuirena glomerata, *Lam.*

Scleria lithosperma, Willd., on Parasnath.

Carex speciosus, Kunth.

CVI.—GRAMINEÆ.

Oryza sativa, Linn.

——— *granulata*, N. ab E.

Zea majus, Linn., (cult.)

Coix lachryma, Linn. near the temple on Parasnath.

Paspalum scrobiculatum, Linn.

——— *brevifolium*, Flügge.

——— *pedicellatum*, N. ab E.

Milium sanguinale, Roxb.

——— *filiforme*, Roxb.

Lappago racemosa, Willd.

Eriochloa annulata, Kunth.

Coridochloa fimbriata, N. ab E.

Digitaria sanguinalis.

Pennisetum cenchroides, Rich.

Panicum colonum, Linn.

——— *compositum*, Linn.

——— *glaucum*, Linn.

——— *sarmentosum*, Roxb.

——— *montanum*, Roxb.

——— *plicatum*, Lam.

——— *humile*, N. ab E.

——— *costatum*, Roxb.

——— *fluitans*, Roxb.

——— *uliginosum*, Roxb.

——— *setigerum*, Roxb.

Isachne australis, R. Br. ?

Thysanolaena acarifera, N. ab E.

Arundinella Wallichii, N. ab E.

——— *setosa*, Trin.

——— *nepalensis*, Trin.

Menisthea laevis.

Rottbœllia, sp.

Manisuris granularis, Linn.

Perotis latifolia, Ait.

Dimeria tenera, Trin. ?

Imperata arundinacea, Cyr.

Saccharum spontaneum, *Linn.*

————— *procerum*, *Roxb.*

————— *Sara*, *Roxb.*

Pollinia villosa, *Munro Mss.*

————— *sp. an P. tenuis*, *Trin.*

Pogonatherum, *sp.*

Anthistiria scandens, *Roxb.*

————— *Wightii*, *N. ab E.*

*Androscepi*a gigantea, *Brongn.*

Apluda aristata, *Linn.*

————— *communis*, *N. ab E.*

————— *filiformis*.

Anatherum muricatum, *Pal. de Beauv.*

Schizachrysum brevifolium, *N. ab E.*

Cymbopogon pachnodes, *Trin.*

Sorghum muticum, *var. tropicum*, *N. ab E.*

Andropogon annulatus, *Försk !*

————— *ischæmum*.

————— *pertusus*, *Willd.*

————— *strictus*, *Roxb.*

————— *halapensis*.

————— *lancifolius*, *Trin.*

————— *lanceolatus*, *Roxb.*

Heteropogon hirtus, *Pers.*

Chrysopogon villosulus, *N. ab E.*

————— *montanus*, *Roxb.*

Sporobolus Wallichii, *Munro Mss.*, (Wall. Cat. 3769.)

————— *pulchellus*, *R. Br*, (Wall. Cat. 8883.)

Polypogon littoralis, *Sm.*

Aristida cœrulescens, *Desf.*

Arundo Madagascariensis, *Kunth.*

————— *Roxburghii*, *Kunth.*

Schœnefeldia pallida, *Edgew.*

Cynodon Dactylon, *Pers.*

Dactyloctenium ægyptiacum, *Willd.*

Chloris barbata, *Sw.*

Leptochloa cynosuroides, *R. & S.*

Avena fatua, *Linn.*

Eragrostis bifaria, *W. & A.*

- Eragrostis cynosuroides*, *Retz.*
 ———— *multiflora*, *N. ab E.*
 ———— *unioloides*, *N. ab E.*
 ———— *Brownii*, *N. ab E.*
 ———— *verticellata*, *Pal. de Beauv.*
 ———— *nutans*, *Roxb.*
 ———— *cylindrica*, *N. ab E.*
 ———— *plumosa*, *Link.*
Tripogon bromoides, *R. & S.*
Elytrophorus articularis, *Pal. de Beauv.*
Dendrocalamus strictus, *N. ab E.*
Bambusa, *sp.*

CRYPTOGAMÆ.

CVII.—MARSILEACEÆ.

- Marsilea quadrifolia*, *L.*
Azolla pinnata, *R. Br.*

CVIII.—POLYPODIACEÆ.

- Goniopteris*.
Pleopeltis.
Niphobolus.
Cheilanthes farinosa, *Kaulf.*
 ———— *tenuifolia*, *Sw.*
Adiantum lunulatum, *Burm.*
Pteris Wightiana, *Wall.*
Asplenium furcatum, *Linn.*
Nephrodium.
Lastraea, *sp.*
 ———— *sp.*
Sagenia, *sp.*
Leucostegia, *sp.*
Ceratopteris thalictroides, *Brongn.*
Lygodium scandens, *Sw.*

CIX.—OPHIOGLOSSACEÆ.

- Ophioglossum vulgatum*, *Linn.*

CX.—LYCOPODIACEÆ.

- Lycopodium*, *sp.*
 ———— *sp.*
Selaginella, *sp.*

*Memoranda on the Peshawur Valley, chiefly regarding its Flora.—**By J. L. STEWART, Esq., M. D.*

The Peshawur valley, from its position between two great botanical regions, the Oriental and the Indian, possesses greater interest in the eyes of botanists than its meagre Flora would otherwise entitle it to, and as no account of its botany has been published, I have been induced to arrange for publication all that I was able to collect on this and some allied subjects during several years' residence there.

So far as I am aware, but little had been done in botanizing in the district previous to 1856. Griffith had at various times spent a few days at Peshawur, during our occupation of Affghanistan in 1839-40. Dr. T. Thomson also had visited it about the same time, and some ten years later a collection of Peshawur plants, with the extent of which I am unacquainted, had been made by Major Vicary of the Bengal Army.

Under these circumstances, I am fortunate in having had it in my power to botanize pretty extensively in the valley, in which and its neighbourhood, I resided from July 1856 to February 1861, (with the exception of eight months in 1857, when I was absent on service at Delhi). During that period I was able to avail myself of several opportunities for visiting places that are not readily accessible to the European traveller, who, in that district, if he stray beyond cantonments, runs a chance of being shot by some fanatic Mussalman, wishing to gain a cheap entrance to Paradise by murdering a Faringí. Near the cantonment of Peshawur, this risk is greatest towards the Khaiber pass, and towards Fort Bárá, and the police have strict orders to watch over any European going to even a short distance in either of these directions.

During the greater part of the time I have mentioned, I resided at Peshawur itself, but I was also stationed for shorter periods at Murdán, Nowshera, Attock and Campbellpore, (and although the last is a few miles Cis-Indus, its Flora is almost identical with that of the Peshawur valley, and may well be included in it.) Opportunities also occurred of traversing part of the Chingláí hills to the North East of the valley, with the Expedition under General Cotton in April and May, 1858, when we reached about 5,000 feet above the sea; of herborizing on

Mount Mítú near Attock, 2,500 feet, the hill at the Cheráát Pass in the Khattak country, 4,700 feet, and various lower spurs near Murdán, Abazái and Michní. I had occasion to traverse the Kohát Pass repeatedly; so that I have had fair opportunities of becoming acquainted with the Flora of the district.

The city and cantonment of Peshawur, which lie towards the Western extremity of the valley of that name, are situated in Long. $71^{\circ} 33'$ E. and Lat. 34° N. at an elevation of nearly 1,200 feet above the sea, and no part of the valley is much above or below this height, although there is a slight rise on all sides towards its edges, and although the level of the Indus at Attock, near which the drainage of the district issues in the Cabul river, is only about 1,000 feet above the sea. All the inequalities of the flat part of the valley will probably be included in from 1,000 to 1,500 feet above the sea.

The valley itself, which constitutes the most Northern part of the long strip of territory comprised in our Trans-Indus possessions and may be described as a broad oval, lying in a north-east and south-west direction, is about 60 miles long and nearly 40 broad. Its chief divisions, which however are more political than geographical, may be enumerated as follows:—*Eusofzáí*; the most North-eastern part of the district situated to the North of the junction of the Indus and Cabul rivers,—*Ashnagar*, to the West of Eusofzáí, and between it and the Swát river,—the *Doábá* between the latter and the Cabul river,—the *Daoodzáí* and the *Khalíl* to the North and West of the city of Peshawur, and *the southern strip of the district, inhabited chiefly by the lower Momands and part of the Khattaks.*

There are no lakes in the district, but in many places there are large marshes (for instance an extensive one close to Peshawur,) and large tracts, particularly in the Doábá, become marshes after much rain. A curious phenomenon is noted on the maps at a place near Topí in the eastern Eusofzáí, where it is stated that a lake of several miles in extent is formed after every eight or ten years. In 1858, I passed over the locality with the force under General Cotton, and found that such a tradition is held by the inhabitants. The part, where the lake is said to be formed, is low, and was then (in May) verdant and almost marshy, water being abundant in pits at 6 and 8 feet from the surface. A small, sluggish stream runs through the tract, and from all I can learn, the so-called “lake” is merely a

marsh formed on this low ground, in seasons of excessive rain, the water, however, never being so deep as to quite conceal the tall grass and reeds.

The principal streams of the valley are three, of which the chief is the Cabul river, the largest affluent of the Indus during its whole course above its junction with the Panjnad at Mittun Kote. This river, which, as well as the next, is called Lúndí, debouches from the Khaiber range a little above the village and fort of Michní, and follows an easterly course for about fifty miles till it falls into the Indus close to Attock. It is joined about fifteen miles from Peshawur by the Swát river, which after draining the valley of that name, issues from the mountains near Abazái, below which its course is south-east for twenty-five miles to join the last. The Bárá stream which is much smaller than either of these, rises in Teera, enters the valley ten miles to the south-west of Peshawur, and flows in an easterly direction to join the Cabul river above its junction with that of Swát. Much of its water, however, is absorbed in an early stage of its course, by various canals for the irrigation of the tracts on either side, one of the largest of these being for the supply of the city and cantonment of Peshawur. The Bodní is quite a small stream, which passes near Peshawur, to the northward, and joins a branch of the Cabul river.

Besides these, there are no permanent large streams, but in the Eusufzái country and other parts of the valley, there are many "nullas" where water flows for a longer or shorter time after rain, and in one or two cases for the greater part of the year; and in and near the beds of these, water is at most seasons found in wells from 12 to 30 feet deep. Indeed were it not for these, great part of the valley would be dependent for moisture on the scanty and precarious rain-fall, and much of it would be totally unfruitful. At many places, *e. g.* the Peshawur cantonment, and near Chumkunnie to the south, water is not found within seventy feet of the surface (at the former with a temperature of 68° to 70° F. in July); and the well which the Sikhs were obliged to dig for the supply of their fort of Futtehghurh, Jumrood, (commanding the exit of the Khaiber,) is said to be no less than 180 feet in depth.

In the ordinary shallow wells, the Persian wheel is almost universal for irrigation purposes, propelled by a pair of bullocks or a buffalo, one advantage of the latter being that he will go on indefinitely

without a driver, when each of his eyes is covered by a conical leathern blinker.

In the valley generally the soil is a strong retentive clay, which is strikingly fertile wherever there is a full supply of water. There are in some places sandy tracts, but the extent of these is limited, and almost the only absolutely unfertile parts are those situated near the circumference of the valley, towards which, nearly every where so far as I have examined, (and the circumstance has been noted by several previous observers,) there exists a wide talus of shingle. This, which slopes towards the middle of the valley, is often several miles in breadth and in many places (*e. g.* near Abazái,) more than 40 feet thick, as seen at cuttings. These shingly tracts are unproductive, but not universally so, as in some places the shingle is covered over by deep layers of a bluish, marly soil, the existence of the former at such places being only discovered at sections natural or artificial. This shingle is in general composed of fragments, more or less rolled, of the harder rocks of the surrounding hills; being mostly of limestone, and hard carbonaceous slate, and more rarely a red clayey rock.

The north-eastern part of the valley is much broken up by spurs and outlying low hills from the mountain mass bounding it in that direction. The latter, at least that part which General Cotton's Expedition passed through, is, in many places, plentifully strewn with blocks and shingle of a syenitic porphyry, which is occasionally seen *in situ*, as at Mungaltáná on the flanks of Mahábun, and at Kubbul on the Indus. Even fragments of this rock, however, are very rare throughout the rest of the valley.

Many of the spurs along this, the north edge of the valley, are composed of a very hard, dark coloured slate similar to that of Attock, generally dipping strongly towards the north or west; on this side, also, micaceous schist frequently occurs, as in the ridge parallel to the Indus at Kubbul, and in the Takht-i-Bái spur in Eusofzái; and a micaceous schistose earthy limestone, near Michní, Shubkuddur and Abazái; in the lower ridges and isolated hills the rocks generally dip towards the north-west and north. Near Michní there is an outburst of trap, under micaceous and quartzose schists.

On the east and south side of the valley as at mount Mitú near Attock,—the ridges south of Nowshera—the range on which, (the pro-

posed sanatorium of) Cheráát is situated,—also on the hills traversed by the Kohát pass, I have never observed granitic rocks or micaceous schists. The greater part of these hills, in which the dip is, generally, westerly at a high angle, and the strike approaches north and south, appears to be composed of various limestones often much contorted, ranging from a dark-coloured very much indurated silicious variety, to a calcareous flagstone containing eoncretionary ferruginous nodules, which has been used for flooring and roofing purposes.

The spurs which extend furthest from the edge towards the centre of the valley, are :—one which terminates at Takht-i-Bái, near which it reaches a height of 700 or 800 feet above the plain, and which is mainly composed of micaceous, quartzose and calcareous earthy schists ; and the Bárá spur, (not far from the western extremity of the valley,) which stretches from the southern edge of the Khaiber hills to near Fort Bárá, and the strata of which appear to dip towards the north-west at an angle of about 45° : this I was unable to visit, as it is in an “unsafe” country, and I think beyond our border. Towards the middle of the valley, rock-masses are but seldom found in situ. There is, however, a low rocky ridge parallel to the Cabul river opposite Nowshera which is composed of calcareous shale, and on which I have found worn pieces of limestone, with obscure fossil shells. Similar limestone fragments, with impressions of Brachiopods (?) are abundant in the shingle of the Jumrood plain (near which Griffith records fossil *Pterocles** as found in arenaceous limestone,) but I have nowhere found any fossil *in situ* in this district, although in a ridge near Campbellpore (16 miles from Attock, cis-Indus) there are extensive beds of limestone abounding in shells.

There are also at various parts of the valley, horizontal beds of varying extent, of soft recent sandstone and conglomerate, and in such situations (as well as in very numerous places trans-Indus, to the south of the Peshawur district,) I have frequently found specimens of two species of shells (apparently *Planorbis* and *Limnea*).

No *kunkur* occurs in the Peshawur valley. nor am I aware of its being found to the west of Jhelum (170 miles to the south-east).

Most of the lime used in Peshawur appears to be brought from the range to the south towards Shamshattú, and besides it, the only

* *Sic.* Griffith, Journals of Travels, p. 428.—ED.

valuable or curious mineral products of the district or its neighbourhood that I am acquainted with are :—iron, which is brought, roughly smelted, in considerable quantity from Bajour, where it is found in the form of iron-sand ; naphtha, (*mumiál* or *gunduk ka tel*) which is procured between Kalabagh and Attock, and used as an application to sores ; asbestos, said to be brought from a locality near the Khaiber pass ; and mica (*sang-i-jaráhat*, or *sím-gil*) which is used in powder and mixed with plaster for giving a silvery appearance to cornices, &c.

A tradition exists among the inhabitants of the district, apparently originating in a desire to account for the elevated sites chosen for many of the numerous ancient cities, whose ruins are found in various parts, that the whole of the bed of the valley was at one time under water. It appears very doubtful, however, if any such body of water has existed since long anterior to the erection of these buildings ; although, that there has been at least partial submergence is evidenced by the fact that in several places, (*e. g.* close to the fort of Abazái, and near Ashnagar,) the remains of numerous buildings are found covered by the usual clayey soil, and whose foundations are several feet below the present level of the ground. These have generally been brought to light by accidental excavations or abrasion by water and are often accompanied by fragments of reliefs, apparently of Indo-Bactrian origin. But little has hitherto been done to throw light on the various ruins and reliefs that have been discovered in the Peshawur district, and the proper examination of the materials already available, with a systematic search for others, would amply repay the labours of any one practised in such researches. It is gratifying to know that part of the local funds have recently been made available for investigations in this direction, under the direction of the Rev. I. Loewenthal of the American Mission, who is admirably qualified for the task, and to whom I am much indebted for aid as to various subjects referred to in this paper.

Considerable tracts of the lower parts of the valley contain much saline matter, which effloresces abundantly on the surface, and the presence of which induces a copious growth of Salsolaceæ with other plants (such as *Tamarix dioica* and *Berthelotia lanceolata*) which flourish in saline soil.

The uncultivated parts of the Peshawur district, are barren in

the extreme, there being no such thing as *forest*, and it is only towards the base of the surrounding hills, where small streams frequently occur (whose waters are, however, rapidly dissipated by irrigation and evaporation) that any considerable amount of shrubby vegetation is seen. This consists mostly of *Acacia Modesta*, *Olea Europæa*, *Dodonæa Burmanniana* and *Reptonia buxifolia*, which continue abundant as one ascends the hills (here, as elsewhere, the fact being noticeable that the southern aspect of the heights is less verdant than the northern;) while on the dry and barren low ground, the most conspicuous shrubs are scattered plants of *Zizyphus Jujuba*, *Adhatoda vasica*, *Capparis Aphylla*, *Salvadora*, *Vitex Negundo* (in dampish spots,) and *Tecoma undulata*.

Under these circumstances, all timber too large to be supplied by the plants above noted, is afforded either by the cultivated trees of the valley such as the mulberry, and *sissoo*, or by the timber rafts brought down the Swát and Cabul rivers, which consist chiefly of deodár, with perhaps other pines. The large fire-wood supply for the cantonment is furnished by the above named shrubs, and large quantities mostly of oak (*Quercus Ilcx*) are brought from the Khaiber. From all I can learn, it appears not unlikely that, ere many years elapse, the supply of fire-wood for Peshawur at reasonable rates, will be difficult or impossible.

The climate of Peshawur may be shortly described as the extreme of that of the Panjâb generally; *i. e.* there are great annual variations of temperature, great daily variation, especially in the cold season, a very dry atmosphere throughout most of the year, and a very limited rain-fall; the last occurring, not at the period of the usual "rainy season" of India, but in winter. I am sorry that I have not at my command any very lengthened series of observations on the meteorology of the district, but I have made use of the best series procurable, *viz.* observations on the temperature, humidity of the atmosphere, rain-fall, and barometrical variations made with the instruments supplied by Government, and extending over most of 1859-60 and the whole of 1861. For these I am chiefly indebted to Dr. Hugh Clark, Bengal Artillery.

Temperature. The observations on temperature were made nine times daily during part of the above period, and four times daily, during the remainder, and may be considered reliable.

TABLE 1.

	Means of daily Maxima.	Means of daily Minima.	Means of these
January,	60.67	37.25	48.96
February, ...	66.76	41.5	54.13
March,	73.88	49.47	61.67
April,	87.96	63.07	75.51
May,	101.11	70.95	86.03
June,	105.92	78.31	92.11
July,	103.95	80.37	92.16
August,	99.9	79.77	89.83
September, ...	97.2	72.65	84.92
October,	87.35	55.28	71.31
November, ...	76.67	42.45	59.56
December, ...	66.7	39.80	53.25
Annl. means,	85.67	59.23	72.45

It thus appears that the three coldest months at Peshawur are December, January and February, during which the average temperature is 52.11° F., the highest single observation being 77° F., in February, and the lowest 32° F. in January; the three hottest months are June, July, and August, the average temperature of which is 91.36° F., the highest single observation noted, being 113.5° F., in June, and the lowest 70.5° F.; the hottest single month being July, with an average temperature of 92.16° F., and the coldest, Ja-

nuary, averaging 48.96° F. The average temperature of the three spring months calculated for these three years is about 80° F., and that of the three months of autumn nearly the same.

As it may be interesting to compare the temperature of Peshawur with that of Saharunpore and Umballa, the nearest places to the south east, with regard to which I possess authentic series of observations, I here give some results for these stations, from the data given by Royle and Edgeworth, with the corresponding Peshawur figures. These shew that although the summers are hotter, and the winters colder at Peshawur than at these two places, yet its mean temperature is rather lower, which corroborates a remark made by Hooker and Thomson in the introduction to the *Flora Indica*.

TABLE 2.

	May, June, July, Saharunpore.	May, June, July, Umballa.	June, July, Augt., Peshawur.	Dec., Jan., Feb., Saharunpore.	Dec., Jan., Feb., Umballa.	Dec., Jan., Feb., Peshawur.
Means of Maxima,	102.	?	103.25	71.7	?	64.71
Means of Minima,	72.16	?	79.48	42.5	?	39.51
Means of these.....	87.08	86.81	91.36	57.1	55.81	52.11

	April to Sept. Saharunpore.	April to Sept. Umballa.	April to Sept. Peshawur.	Oct. to March. Saharunpore.	Oct. to March. Umballa.	Oct. to March. Peshawur.
Means of Maxima,	97.58	?	99.34	79.75	?	72.
Means of Minima,	70.25	?	74.18	46.25	?	44.29
Means of these,	83.91	84.15	86.76	63.00	62.07	58.14

	July. Saharunpore.	July. Umballa.	July. Peshawur.	January. Saharunpore.	January. Umballa.	January. Peshawur.	Annual. Saharunpore.	Annual. Umballa.	Annual. Peshawur.
Means of Maxima, ...	95.5	?	103.95	64.5	?	60.67	88.66	?	85.67
Means of Minima, ...	76.0	?	80.37	38.5	?	37.25	58.25	?	59.23
Means of these,	85.75	84.41	92.16	51.5	53.03	48.96	73.40	72.85	72.45

Several circumstances combine with the much diminished rainfall of summer to increase the heat at that season; viz., the valley being walled in on all sides by hills, these being very bare of vegetation, so that they absorb heat freely during the day, which is as freely radiated in the night, and the generally clear summer nights which also favour radiation.

I am sorry that under the head of daily range of temperature, I can only give the following figures for three months of 1861. These however I can certify as reliable, the observations having been made by Dr. J. J. T. Lawrence, who has devoted much attention to the study of meteorology in various parts of the Punjab.

TABLE 3.

1861.	Mean daily range of temperature.	Extreme range of tem- perature in each month.
January,	24.8	42.6
February,	27.2	39.4
March,	25.6	44.6

I have noted upwards of 40° F. of range in one day (March, 1857,) near Peshawur. For Umballa, in January, Edgeworth gives the diurnal mean variation as 24° 29 F. and the extreme diurnal range as 35° F.

At Peshawur, spring commences early in February, when the willow begins to bud, and in March most of the trees are again in full leaf. After this the temperature rises rapidly, and the summer heat, especially in July, is most oppressive and sultry, though tempered in that month by frequent dust-storms, often followed by showers. Mirage is in the hot season, a not uncommon phenomenon, and I have repeatedly seen it simulate lakes, trees and houses, where in reality there only existed a parched, baked soil, with here and there a straggling bush, and a bit of mud wall, or a few stones.

In August, autumn fairly sets in, the leaves of the trees getting brown and beginning to fall; in that month most of the willows, &c. become bare; and during September, when the marsh at Peshawur is probably at ebb, many of the aquatic plants common in it (*Nelumbium*, *Typha*, *Sagittaria*, *Alisma*, and many *Cyperaceæ*) have fruited and dried up.

After September the temperature rapidly diminishes for three months, and slight earthquakes are occasionally felt up to April. Although I have never seen snow fall in the valley during a residence there of the greater part of five winters, yet I think that slight falls of snow on the plain, are authenticated on at least two different occasions within the last few years, when, however, it remained unmelted for only a very short time. In each winter there are generally repeated falls of snow on those hills surrounding the valley, which reach to more than 3000 feet above the sea; and on the higher hills towards the north-west (Tartarra, over the Khaiber Pass, within 25 miles of Peshawur, is 7000 feet) snow is frequently seen for many days together; while on the still loftier inner ranges visible, it lies for many weeks at various times from the middle of November till the middle of May.

Barometer.—The following table shews the average barometrical variations calculated from four daily observations for most of the months of 1859-60, and the whole of 1861.

TABLE 4.

	Means of Maxima.	Means of Minima.	Means of these.
	in.	in.	in.
January,	28.926	28.704	28.815
February,	28.841	28.696	28.768
March,	28.806	28.655	28.730
April,	28.726	28.552	28.639
May,	28.554	28.442	28.498
June,	28.491	28.312	28.401
July,	28.377	28.310	28.343
August,	28.525	28.389	28.457
September,	28.599	28.523	28.561
October,	28.757	28.635	28.696
November,	28.858	28.770	28.814
December,	28.889	28.836	28.862
Annual Means,	28.695	28.568	28.632

Amount of Rain. The rain-fall, calculated from observations for the period from November 1859, to October 1860, and the whole of 1861, is as follows.

TABLE 5.

	1861.	Nov. 1859 to Oct. 1860.	Mean of these.
	inches.	inches.	inches.
January, ... ..	.795	3.	1.897
February, ... ..	.155	3.5	1.827
March, ... ..	.725	1.5	1.112
April, ... ..	.480	0.	.240
May, ... ..	.185	4.5	2.342
June,	1.680	0.	.840
July,	7.799	2.	4.899
August, ... ..	.848	0.	0.424
September, ... ..	.287	0.	.143
October, ... ..	.052	0.	.026
November,	0.	1.5	.75
December,	1.322	1.011	1.166
Total Annual,	14.328	17.011	15.669

The annual amount of rain of Saharunpore and Meerut averages about 30 inches.

Humidity. The following table gives the mean temperature for each of the months of 1861 (calculated from the means of the

maxima and minima) with the means of the (four) daily observations of the Wet-bulb Thermometer, and the Dewpoint computed from these by Glaisher's formula.

TABLE 6.

1861.					Mean temperature of air (from Means of Max. and Minima.)	Means of four daily observations of wet bulb Thermometer.	Dew Point.
					°	°	°
January,	...	...	...	...	49.05 F.	46.46 F.	43.87 F.
February,	...	...	...	...	55.2	48.53	41.20
March,	...	...	...	...	61.05	50.75	42.51
April,	...	...	...	...	76.6	61.3	50.59
May,	...	...	...	...	88.	69.35	58.16
June,	...	...	...	...	92.55	70.55	57.35
July,	...	...	...	...	87.95	79.15	73.87
August,	...	...	...	...	87.05	79.4	74.81
September,	...	...	...	...	82.1	73.27	67.98
October,	...	...	...	...	68.45	57.85	50.43
November,	...	...	...	...	58.	46.42	36.
December,	...	...	...	...	52.25	47.17	42.09
Annual Means,	...	...	...	...	71.52	60.85	53.39

This at once shews the remarkable deficiency of atmospheric moisture at Peshawur during the year (and that in a season with more than the average amount of rain,) especially in the months of April, May, and June.

Wind. Four daily observations of the direction of the wind were made during 1861, but not regularly; however I assume that the irregularities were so irregular as in great measure to counterbalance each other, and the results are as follows.

It appears that throughout 1861, northerly and easterly winds were to southerly and westerly nearly as 9 to 5½, but from October to March southerly and westerly winds prevailed; and judging, from partial observations, which, however, ranged over the year, the night-breeze was generally from the southerly and westerly directions.

I shall now proceed to discuss the more immediate subject of the present paper, viz. the vegetation of the Peshawur valley, beginning with a survey of the cultivated plants.

It being well known that cold accompanied by moisture is much more apt to impede and destroy the vital functions of plants, than is dry cold, it can readily be conceived how the low temperature at Peshawur during the three coldest months, (averaging only 52° 11 F. and occasionally sinking below the freezing point) coupled with the 4.890 inches of rain that then fall, must effectually prevent the growth and culture of many trees, &c., that are found to thrive in the North-West Provinces, and render ineffectual the efforts to ripen fruit by others that are rather more hardy. Thus at Peshawur we look in vain for *Crataeva religiosa* (which grows at Jhelum, 170 miles to south east,) *Bombax*, *Grewia Asiatica*, *Aegle*, *Bergera*, *Feronia*, *Shorea*, *Sapindus*, *Cedrela*, *Acacia Arabica* (common in the lower Punjab,) *Tamarindus*, *Erythrina*, *Terminalia*, *Psidium*, *Nauclea*, *Morinda*, *Bassia*, *Mimusops*, *Millingtonia hortensis*, *Cordia* (which grows freely as far up as Lahore, 270 miles to the south-east,) *Gmelina*, *Emblica officinalis*, *Iatropa*, *Artocarpus*, *Bambusa*, (which has been repeatedly tried at Peshawur, and grows but does not thrive at Jhelum,) and others which are commonly cultivated (many also occurring wild) in the N. W. Provinces: and if, of some of these rare specimens occur in gardens at Peshawur, they are reared and preserved with difficulty; it is hopeless to search for such plants as the following; *Anona Nephelium*, *Eriobotrya*, *Carica Papaya*, *Santalum album*, *Piper Betel*, *Pandanus*, *Ananas*, *Caryota*, *Borassus*, *Cocos*, and the cultivated *Marantaceæ* and *Zingiberaceæ* which are only raised with difficulty in certain favourable situations in the N. W. Provinces.

Even *Opuntia* and *Agave* I have not seen in the valley, nor the various columnar and other *Euphorbiæ*; all of which are common as hedges, Cis-Sutlej.

Again, some tropical plants continue to exist at Peshawur, being favoured by exceptional circumstances of structure; *e. g.*, the plantain, whose vitals (so to speak) are protected by its closely sheathing leaves during the cold spring months, and which thrives tolerably as far as foliage is concerned, though its fruit is never matured.

The mango (which Timúr Shah is said to have made an unsuccessful attempt to introduce at Peshawur) barely lives, and in favourable seasons and situations ripens a little fruit, and there are a few trees of *Syzygium Jambolanum*, but most of them never produce mature fruit.

As is generally the case near other cities, Trans-Indus, and as far up as Jellalabad, there are about Peshawur a good many trees of *Phœnix dactylifera*, but the fruit, though carefully protected from the birds by nets, is I believe never good. The abundance of dates which are consumed by the inhabitants are mostly imported from the west.

The *Azadirachta Indica* (nīm) does not grow here, (it reaches Lahore) but its congener *Melia Azedarach* (bakáin Hindí, drek Punjábí) is easily raised and common.

Dalbergia Sissoo is commonly planted, and grows to a great size, and of it there are occasionally magnificent old trees in villages, and at tombs, &c. ; one of these near Akora, being called, I believe, "Gilbert's tree," from an erroneous tradition that under it the "flying General" received the submission of the Sikhs! or Affghans! whom he had here caught up after the battle of Goojrát.

Besides these the ordinary trees planted by groves and by waysides, &c. are *Acacia Lebbek*, *Morus lævigata*, *Tamarix Gallica* (on the lower saline parts in large groves by villages,) and *Zizyphus Jujuba*. *Salix Babylonica* (?) is abundant by water-courses, &c., although Royle suggests that Elphinstone's "trees like willows" of the western Punjáb, are *Salvadora*.

Moringa pterygosperma, *Populus alba*, *Cassia fistula* and *Bauhinia variegata* are much less frequent than the above; *Sesbania Ægyptiaca* is common as hedges, and *Parkinsonia* grows well; *Ficus religiosa* and *F. Indica* are occasional in villages, and *Salix Ægyptiaca* is cultivated to some extent for the fragrant *bed mushk* distilled from its flowers, which is a favourite ingredient in the sherbets of the natives and supposed to be possessed of great virtues. *Cupressus sempervivens* flourishes in gardens as does *Populus fastigiata*, the latter called by the natives *Kashmíri sufedar*, so that it may have been introduced from Kashmir, where it abounds; very stunted specimens of *Platanus orientalis* and of *Juglans regia* occur in one or two gardens.

Peshawur was, by its early European visitors (from Elphinstone up to our conquest of the Punjáb) much lauded for its fruits, but perhaps unduly so, as almost the only kinds now cared for by Europeans are grapes and peaches, both of which are in their season (June, July) plentiful and excellent. Besides these, Quinces, Pomegranates, Plums, Figs, and various members of the orange family thrive well, and it is very pleasant, in spring, to ride round the extensive "peach gardens"

near cantonment, when the trees are in full blossom, and their scent is so powerful as to be *almost* oppressive. Indeed, at that season, Peshawur, with its widespread and blooming orchards, its abundant verdure, fine climate, and view of the snowy hills towering in masses to the north and north-west, is by no means the least pleasant station in India, so far as physical circumstances are concerned.

In one or two gardens there are some small trees of a *Diospyros* (*D. Lotus*?) which is common in the hills to the west of Kashmir, and both wild and in gardens, in Affghanistan. Its fruit *amluk*, is much esteemed by Affghans, (although I presume most Europeans would agree with Griffith that as a fruit it is "not worthy of any notice") and is procurable in abundance in the bazars, whither it is brought from Swát, &c. but it does not thrive well in the plains.

In gardens, the ordinary vegetables of the N. W. Provinces succeed, as do most of those of Europe that have been introduced into other parts of the plains of India. Potatoes have in some years thriven, but only exceptionally.

The field cultivation is much the same as that of the North West Provinces, and may be noted as follows.

1st. In the cold weather, when the climate and crops (*rubbee*) are much more nearly European than at other seasons, the grain-crops consist of wheat and barley which are sown in October, November and December, (advantage being generally taken of previous showers,) and harvested about May. The young crop is in spring frequently cut and given as fodder to horses, under the name of *Kasíl*. The rains of the cold season render irrigation unnecessary for these, as for *Lawsonia* and *Sinapis*; while most of the following, also sown about the same time, have more or less irrigation; *Trigonella Fænum Græcum*, *Errum Lens*, *Vicia Faba*, *Beta Bengalensis*, *Coriandrum sativum*, *Anethum sowa*, Carrot, Radish, and Turnip. Several of these are only grown in gardens.

2nd. Field and garden crops (*Khurreef*) of the hot and rainy seasons, mostly sown in March and April (with one or two exceptions, such as Maize and Sorghum which are sown considerably later,) and ripening from July, (*Cucurbitaceæ*) to November, (Sorghum). The crops of this season are the following. Rice, of which several varieties are grown; by far the most esteemed of which is that of *Bará*, produced only at two or three villages near the *Bará* stream, not

far from the fort of that name, and some of which *e. g.* the produce of Shekan village, is said to sell as high as $2\frac{1}{2}$ to $1\frac{1}{2}$ seers a rupee; Maize; *Sorghum Vulgare*; *Setaria Italica*; *Penicillaria spicata*; *Panicum miliaceum*; *Phaseolus aconitifolius*, *Paureus*, and *P. radiatus*; *Dolichos*, *Cajanus flavus*, *Cicer arietinum*; *Portulaca*; *Solanum melongena*; *Sesamum orientale*; onion; six species of *Cucurbitaceæ*; *Colocasia antiquorum*; sugar, cotton, indigo, and tobacco. Of these only Maize, *Setaria*, *Phaseolus aconitifolius*, *Cicer arietinum* and *Sesamum* are not regularly irrigated.

As regards irrigation generally, it may be stated that where the land is wholly, or nearly, dependent on rain for moisture, only one crop a year is obtained; a large proportion of the land, especially of course that near the Cabul, Swát and Bárá rivers, yields two crops; while some patches near the city of Peshawur are said, with management, to give three crops a year.

But little Indigo and Lawsonia are grown, and only a small quantity of Flax is cultivated for its oil-seed; Sesamum, for a similar purpose, is not common, almost all the "sweet" oil used, being imported from below. Elphinstone erroneously supposes most of the oil used to be obtained from the Castor-oil plant (*budanjeer*) which, however, nowhere in the valley grows in sufficient quantity to furnish a tithe of the oil consumed. Sinapis is largely cultivated for its bitter (*Karwá*) oil.

There is no cultivation of *Carthamus*, nor I think of *Eleusine* or *Paspalum*, and the Poppy is very uncommon. There is no *Crotalaria juncea*, and *Hibiscus cannabinus* is but rarely grown along the edges of fields for its fibre. *Ricinus* and *Cannabis* are never cultivated, though both are common in waste ground.

In low rich ground near villages, &c., where water is plentiful and manure easily got, a good deal of sugarcane is grown, though producing only a very small proportion of the sugar consumed in the valley. A great deal of Cotton is raised, being sown about April and picked in September. Tobacco is a common crop, and immense quantities of the dried leaf are also imported from Affghánistán, the Kándahári being reckoned the best.

It is interesting to observe that among the Pushtú speaking inhabitants of the valley, the names of most of the common crops are the same as in Hindustání. A few, however, are apparently derived from

the Persian, *ghanum*, wheat, *kanzhale*, *Sesamum*, and *wasma*, Indigo, while some others that differ much or entirely from Hindustání are *urbushe* barley (connected by Mr. Loewenthal with the words *οροβος* and *erbse* in Greek and German,) *karízah* or *nakrízah*, *Lawsonia*; *malkhozí*, *Trigonella*; *típar*, turnip; *shole*, rice; *ghokht*, *Setaria Italica*; *kalol*, *Panicum Miliaceum* (?); *mai*, *Phaseolus Mungo*; *wurkharee*, *Portulaca*; *aozhah*, garlic; and *khatakæ*, melon.

The only crop manured on the large scale is sugarcane and occasionally Maize, and cultivation and irrigation are carried on much in the same way as in the N. W. Provinces, except that where the latter is performed by wells, the water is almost universally raised by means of the Persian wheel (*arhat*) instead of the leathern bag, (*charsa*). The water for irrigation is often brought from great distances in canals, and some of these must have cost immense labour. The more important of these are traditionally ascribed to "Akbar-badshah," but the traditions of the valley on this and other points are perhaps not always quite trustworthy.

Horses are not extensively reared in the valley, the great supply being obtained from the westward, whence come many *kafilas* each cold season. Wheel carriages are quite unknown among the inhabitants of the country parts of the valley, and all internal traffic in merchandise, grain, &c. is conducted by means of pack-bullocks, many of which are of a fine strong breed, very much superior to the ordinary kind generally used in ploughing, &c. here as elsewhere in India. Very large flocks of sheep and goats are reared, and the extensive thorny enclosures, formed (generally of dry *Zizyphus* bushes) for their protection from the night attacks of wild animals may be seen studded over even the driest parts of the plain at certain seasons.

Among the more uncommon or characteristic fauna of the Peshawur district may be mentioned the following. The *Márkhor* (*Capra megaceros*) is frequent in the hills to the north-east and said to be found in the Khattak range. The *Ooríál* or *Kohídoomba* (*Ovis Vignei*) is found in the hills to the east of the valley, (and is common in some of the low hills near Hussan Abdál, and southward toward the Salt Range.) Porcupines, in Pushtú *Shkúnr* (*Hystrix cristata*?) occur in various parts of the district; I have found quills at 4,700 feet above the sea (at Cheráát) but it appears very doubtful if the animal lives in such places. A Pangolin (*Kishaur*;) is by no means

uncommon in various localities, attaining a length of 4 feet and upwards; its scales are much valued as a medicine by some classes of Hindoos. The "grave digger" *gorkakh*, *gorkash* (*bijú* Hindi) is occasional. A fresh-water tortoise, *shamshatæ*, inhabits the rivers, and attains a length of upwards of two feet. In the drier and more sandy parts, the soil is burrowed by thousands of a kind of lizard, *charmukhkæ* or *charmushkæ*, about a foot long, and I have repeatedly found live specimens of an allied, but amphibious animal, of considerably larger size, in water contained in hollows, on the hills around the valley.

A characteristic bird is the *obára* (*otis*) which is common in the drier, uncultivated parts and is interesting to the sportsman as it affords good hawking; as well as to the gastronome from a different point of view.

Several species of serpents occur in the district, but almost all—of scores—that I have examined, had no poison-fang, and I have never actually *known* of a case of death from a serpent bite near Peshawur.

In entering upon a detailed view of the Flora of Peshawur, I shall first give a list of all the plants I collected in the district with their periods of flowering, so far as this was noted by me, their frequency, and the native names of the more important species. Almost all the identifications are those of Dr. T. Thomson, my obligations to whom in this and other respects, it is impossible for me to overrate.

Some remarks are added as to the geographical distribution of the Peshawur plants, followed by a few observations on the more noteworthy species.

In this list, the plant is understood to grow in the *plain* of Peshawur, *i. e.* about 1000 to 1500 feet above the sea, unless where a height is added, and all the native names are those in use by the Pushtu speaking inhabitants unless when otherwise stated. I have been careful to exclude all Pushtu names that I do not know to be in use in the Peshawur district.

List of plants collected in and near the Peshawur valley.

Name of plant.	Frequency.	Period of flower or fruit.	Pushu name.
<i>Ranunculus aquatilis</i> , L.	Abundant.	January, February fl.	
<i>R. sceleratus</i> , L.	Ditto.	Oct. Feb. a few up to July fl.	
<i>R. muricatus</i> , L.	Ditto.	Feb. fl.	
<i>R. arvensis</i> , L.	Ditto.	Feb. March fl.	
<i>R. latus</i> ?	Very rare and only found in leaf.		
<i>Adonis autumnalis</i> , L. ?	Abundant.	March, April fl.	
<i>Ceratocephalus falcatus</i> Mench.	A few plants at one place only.	April fl.	
<i>Clematis orientalis</i> , L. ?	Above 4,000 feet.		
<i>Cocculus Loebea</i> , Forsk.	Abundant on dry precipitous banks.	Oct. Nov. fl. and fr.	Parwatti.
<i>Nelumbium speciosum</i> .	Common in some marshes, probably introduced.		
<i>Papaver cornigerum</i> , Stocks.	Rare.	Beginning of July fl.	
<i>P. dubium</i> var <i>β</i> levigatum.	Common.	April fl.	Lalagúl.
<i>Fumaria officinalis</i> var. <i>parviflora</i> .	Profuse.	March fl.	
<i>Hypecoum procumbens</i> , L.	Abundant.	Feb. March fl.	
<i>Capsella Bursa Pastoris</i> , L.	Ditto.	March, April fl.	
<i>Sisymbrium Irio</i> , DC.	Ditto.	Feb. March fl.	
<i>Lepidium Draba</i> , L.	Ditto.	Ditto, ditto.	
<i>Lepidium ruderalc</i> , L. ?	Common.	Feb. fl.	
<i>Malcolmia Africana</i> , R. Br.	Abundant.	Feb. March fl.	
<i>Goldbachia levigata</i> , DC.	Ditto.	March, April fl.	
<i>Leptaleum filifolium</i> , DC.	Common.	March fl.	Páchagúl.
<i>Malcolmia</i> , sp.	Profuse.	Ditto.	Shawanáú.
<i>Notoceras</i> , sp.	Abundant.	Ditto.	
<i>Eucidium Syriacum</i> , DC.	Ditto.	March, April fl.	
<i>Alyssum Calycinum</i> , L. ?	Common.	Feb. March fl.	
<i>Sisymbrium Sophia</i> , L.	Ditto.	March, April fl.	
		Ditto, ditto.	

Name of Plant.	Frequency.	Period of flower or fruit.	Pushu name.
<i>Nasturtium</i> , sp. ?	Not common.	March fl.	
<i>Arabis arenosa</i> ?	Rare.	Ditto.	
<i>Neslia paniculata</i> , Desv.	Ditto.	Ditto.	
<i>Chorispora</i> , sp.	Rare.	April fl.	
<i>Cnicifora</i> .	Not common.	March fl.	
<i>Oligonecris glaucescens</i> .	Abundant.	Most of year fl.	
<i>Polanisia icosandra</i> .	Common on dry precipitous banks.	July, Nov. fl.	
<i>Capparis spinosa</i> , L.	Common.	Oct., Nov. fl. &c.	
<i>Capparis aphylla</i> , W. A.	Rare.	July, Nov. fl.	
<i>Cleome Ruta Jacq.</i>	Ditto.	Sept. fl.	
<i>C. droserifolia</i> .	Ditto.	Augt. Oct. fl.	
<i>C. linearis</i> .	Very rare, in leaf.		
<i>Viola Patrinii</i> ?	Rare.	May fl. Nov. fr.	
<i>V. sp.</i>	Ditto.	Augt. fl.	
<i>Polygala Vahlana</i> , DC.	Common in saline ground.	Nov. Feb. fl.	
<i>Frankenia pulverulenta</i> , L.	Common.	Augt. Oct. fl.	
<i>Mollugo nudicaulis</i> , L.	Not common.	Ditto, ditto.	
<i>M. Cerviana</i> , Ser.	Abundant.	Feb. March. fl.	
<i>Arenaria serpyllifolia</i> , L.	Common.	Feb. fl.	
<i>Silene conoidea</i> , L.	Ditto.	Feb. March fl.	
<i>S. sp.</i>	Ditto.	March fl.	
<i>S. lacyssoroides</i> , Boiss.	Abundant.	June fl.	
<i>Dianthus</i> , sp.	Not uncommon.		
<i>D. sp.</i>	Not common.		
<i>Caryophyllaceæ</i> ?	Rare.		
<i>Do. ?</i>	Not common.		
<i>Bergia ammannioides</i> .	Common where damp.	Nov. March fl.	
<i>B. ustivosa</i> , W. and A.	Rare.	July, Nov. fl.	
<i>Linum trigynum</i> , Roxb.	At 3,000 feet.		

Kharra.
Kirra.

<i>L. strictum</i> .	Very rare.	Most of year fl. or fruit.	
<i>Crozophora tinctoria</i> , <i>Juss.</i>	Abundant.	June, Nov. fl.	
<i>Euphorbia thymifolia</i> , <i>Roxb.</i>	Ditto.	April, Oct. fl.	
<i>E. hypericifolia</i> , <i>L.</i>	Ditto.	Oct. fl.	
<i>E. dracunculoides</i> , <i>Lam</i> ?	Very rare.	Feb. March fl.	<i>Ganda bâte.</i>
<i>E. Helioscopia</i> , <i>L.</i>	Abundant.		
<i>E. Peplus</i> ?	Rare.		
<i>Flüggea virosa</i> .	Very rare.	Oct. fl.	
<i>Ricinus communis</i> , <i>L.</i>	Common.	Oct. March fl. and fr.	
<i>Andrachne telephoides</i> , <i>L.</i>	Common on dry mounds.	Oct. June fl.	
<i>A. aspera</i> .	Not common.	July, Aug. fl.	
<i>Baliospermum</i> , sp.	Ditto.	Oct. fl.	<i>Toropánda.</i>
<i>Abutilon Indicum</i> , <i>G. Don.</i>	Rare.	Augt. Nov. fl.	
<i>Malva parviflora</i> , <i>L.</i>	Abundant.	Feb. March fl.	<i>Panírak.</i>
<i>Abelmoschus ficulneus</i> , <i>W. and A.</i>	Common in fields.	July fl.	
<i>Hibiscus lirtus</i> , <i>L.</i>	At 2,500 feet.	Augt. fl.	
<i>H. sp.</i> ?	Not uncommon, fields.	July, Nov. fl.	
<i>Melhamia abutiloides</i> , <i>Wight.</i>	Rare.	Augt. fl. and fr.	
<i>Corchorus trilocularis</i> , <i>L.</i>	Common.	Augt. fl. and fr.	
<i>C. olitorius</i> , <i>L.</i>	Abundant.	April, Oct. fl. and fr.	
<i>Grewia oppositifolia</i> , <i>Ham.</i>	At 2000 to 3000 feet.	Augt. Nov. fr.	<i>Pastavane.</i>
<i>Grewia Rothii</i> , <i>DC.</i>	At 2000 to 2500 feet.	Augt. fruit.	
<i>G. Betulaefolia</i> , <i>Wall.</i>	Not uncommon on low hills.	Augt. Oct. fruit.	<i>Khércha.</i>
<i>Dodonæa Burmanniana</i> , <i>DC.</i>	Not uncommon.	Feb. fl. (in cultivation).	<i>Gharáske ; Sánatta, Punj.</i>
<i>Erodium martianum</i> , <i>L'H.</i>	Abundant.	March, April fl.	
<i>E. Cicutarrum</i> , <i>L.</i>	Ditto.	Feb. April fl.	
<i>E. sp.</i> ?	Rare.	March fl.	
<i>Oxalis corniculata</i> , <i>L.</i>	Abundant on edges of ditches, &c.	Oct. March fl.	<i>Trurthke.</i>
<i>Fagonia Cretica</i> , <i>L.</i>	Abundant.	Oct. March fl. and fr.	<i>Aghzai.</i>
<i>Tribulus terrestris</i> , <i>L.</i>	Ditto.	March, Oct. fl. and fr.	<i>Krinda.</i>
<i>Peganum Harmala</i> , <i>L.</i>	Profuse.	April, Oct. fl. and fr.	<i>Spelane.</i>
<i>Haplophyllum</i> , sp.	Very rare.	June fl.	
<i>Catha edulis</i> , <i>Forsk</i> or <i>Celastrus</i> ?	Common.	Augt. Oct. fl. and fr.	<i>Suraghzai ; Paták, Punj.</i>
<i>Sageretia</i> , sp.	Ditto.	Augt. Nov. fl. and fr. ?	<i>Mundni.</i>
<i>S. oppositifolia</i> .	Not uncommon.		

Name of plant.	Frequency.	Period of flower or fruit.	Pushtu name.
<i>Zizyphus Jujuba</i> , Lam.	Profuse.	Oct. Nov. fl. and fr. large var. small ditto.	<i>B-rya</i> . <i>Karkana</i> .
<i>Z. Vagaria</i> , Lam.?	Very rare.	Oct. fl.	<i>Wurkei Kukei</i> .
<i>Rhamnus virgatus</i> (two species?)	Occasional plain & com. to 2,500 feet.	Aug. Nov. fl. and fr.	<i>Shue (Schnee)</i> .
<i>Klus</i> (Kakra singhi) <i>acuminata</i> .	Very rare.		<i>Khep</i> , Punj.
<i>Crotalaria Burlia</i> , Ham.	Common.	Oct. Nov. fl.	
<i>Crotalaria medicaginea</i> , Lam.	Very rare.		
<i>Acacia Jacquemontii</i> .	Not common.	Nov. fl.	<i>Hanza</i> .
<i>A. Modesta</i> , Wall.	Abundant.	April, May fl.	<i>Palosa</i> ; <i>Phuldi</i> , Punj.
<i>Dalbergia sissoo</i> , Roeb.	Common by streams, &c.	Oct. fr.	<i>Shera</i> ; <i>Tadi</i> , Punj.
<i>Taverniera</i> , sp.	Rare.	Oct. fl.	<i>Sassd</i> .
<i>Alysicarpus bupleurifolius</i> , DC.	Very rare.	Oct. fr.	
<i>Vicia sativa</i> , L.	Common.	Feb. fl.	
<i>Melilotus parviflora</i> , Desf.	Abundant.	Feb. March fl.	
<i>Medicago denticulata</i> , Willd.	Ditto.	Ditto, ditto.	
<i>Medicago maculata</i> , Willd.	Ditto.	Dec. March fl.	<i>Khkore</i> .
<i>M. Lupulina</i> , L.	Not uncommon.	March fl.	
<i>Astragalus tribuloides</i> , Del.	Common.	April fl.	<i>Ogdi</i> .
<i>A. sp.</i>	Occasional.		
<i>A. sp.?</i>	Not uncommon.	March, April fl.	
<i>Alhagi Maurorum</i> , L.	Abundant.	June, Aug. fl.	<i>Zoz, Zozdn</i> .
<i>Trifolium repens</i> , L.		April fl.	<i>Shafal</i> , shotal.
<i>Lotus angustissimus</i> , L.	Not uncommon.	Ditto.	<i>Rang kakh</i> .
<i>Sesbania aculeata</i> , Pers.	Occasional.	July fl. Nov. fr.	
<i>Prosopis Stepaniana</i> , Spr.	Abundant in fields.	Nov. fl.	<i>Aghzakai</i> ; <i>jand</i> , Punj.
<i>Edwardia mollis</i> , Royle.	Not uncommon, stunted.		<i>Ghwaraja</i> .
<i>Indigofera Gerardiana</i> , Wall.	3,000 feet.		<i>Kashei</i> .
<i>Rhynchosia minima</i> , DC.	Ditto.	Aug. fl.	
<i>Lepedeza juncea</i> , Pers.	Not uncommon.		
<i>Leguminosae?</i>	At 3,500 feet.	June fl.	
	Rare.		

Leguminosæ ?	Rare.	July fl.	Karwārei.
Rubus fruticosus, L.	Not uncommon.	June, Oct. fl. fr.	
Potentilla supina, L.	Common.	Nov. Mar. fl.	
Rubus lasiocarpus.	Only in leaf, once.		
Amygdalus Persica.	At 5,000 feet ?		
Epilobium tomentosum, Vent.	Abundant at water.	June, Nov. fl. fr.	Pharghashidi.
Trapa Bispinosa, Roeb.	Occasional.	Oct. fl. and fr.	
Ceratophyllum demersum ?	Profuse in water.		
Ammannia auriculata, Willd.	Common.	July, Nov. fl.	
A. vesicatoria, Roeb.	Abundant in irrigated fields, &c.	Nov. fr.	
Grislea tomentosa.	Rare.		
Tamarix orientalis, Forsk.	Common.	April fl.	Khwa, Ghwa.
T. dioica, Roeb.	Abundant by streams.	July fl.	Pilehi, Punj.
Citrullus colocynthis ?	Rare.	April fruit.	Maraghane, Kharuma.
Trianthema pentandra, L.	Occasional.	Augt. Nov. fl.	
T. crystallina.	Rare.	Augt. Oct. fl.	
Portulaca-oleracea, L.	Common.	July, Oct. fl.	
P. quadrifida, L.	Rare.	Augt. fl.	
Spergularia rubra, Pers.	Common.	Feb. March fl.	
S. media, Pers.	Ditto.	Ditto, ditto.	
Herniaria hirsuta, L.	Common.	March, April fl.	
Tillæa muscosa.	Not common.	March fl.	
Crassulacæ ?	Rare.	Ditto, ditto.	
Orygia trianthemoides, W. and A.	Occasional.	July fl. ?	
Stem angustifolium, L.	Common, marshes.	June fl. ?	
Eryngium dichotomum, Desf.	Not common.	April, July fl.	
Pimpinella crinita Boiss. ?	Occasional.		
Achænanthe stolonifera, Roeb.	Not uncommon.	July fl.	
Umbellifera ?	Occasional.		
Galium aparine, L.	Abundant.	March fl.	
G. tricornæ ?	Occasional.	March, April fl.	
Asperula cynanchica, L. ?	Rare.	Augt. fl.	
Rubiaceæ ?	Ditto.		
Scabiosa Olivieri.	Common, on dry plains.	March fl.	
Artemisia elegans, Roeb.	Abundant.	July, Oct. fl.	Lavange.

Name of Plant.	Frequency.	Period of flower or fruit.	Pushita Name.
<i>A. vestita</i> , Wall.	Rare.	Sept. Nov. fl.	<i>Tarkh</i> ?
<i>A. laciniata</i> , DC. ?	Common.		
<i>A. indica</i> ?	Rare.		
<i>Eclipta erecta</i> , L.	Abundant at water.	Most of year, fl.	
<i>Sonchus arvensis</i> , L.	Abundant.	Augt. Feb. fl.	
<i>S. oleraceus</i> , L.	Common.	Feb. Sept. fl. ?	
<i>Phænopus vinicus</i> , DC.	Abundant.	April, Oct. fl.	
<i>Taraxacum officinale</i> , Willd.	Ditto.	Feb. fl.	<i>Shamukei</i> .
<i>Matricaria disciformis</i> , DC.	Ditto.	Feb. March fl.	
<i>M. Præcox</i> , DC.	Ditto.	March, April fl.	
<i>Microthylus nudicaulis</i> , Less.	Ditto.	Oct. March fl.	<i>Sateigul</i> ; <i>Babuna</i> , Hindi.
<i>Gnaphalium multiceps</i> , Wall. ?	Common.	March, Nov. fl.	<i>Tartizha Spádúkei</i> .
<i>Calendula officinalis</i> , L.	Abundant.	March, April fl.	<i>Zergul</i> .
<i>Lactuca auriculata</i> , Wall.	Common.	Ditto, ditto, ditto.	
<i>Koelpinia linearis</i> , Pall.	Common.	Ditto, ditto, ditto.	
<i>Cirsium arvense</i> , L.	Abundant in fields.	March, Oct. fl.	<i>Aghzai, Azghai</i> .
<i>Silybum Marianum</i> , DC.	Not uncommon.	April, March fl.	
<i>Centaurea Calitrapa</i> , L.	Abundant.	April, June fl.	
<i>Scorzonera</i> n. sp. ?	Common.	April fl.	<i>Wrázi</i> .
<i>S. sp.</i> ?	Occasional.	March fl.	
<i>Carthamus oxyacantha</i> , Bieb.	Abundant.	April, June fl.	
<i>Cichorium luteolus</i> , L.	Occasional.	April, July fl.	
<i>Blumea lacera</i> , DC. ?	Not uncommon.	March, April fl. ?	
<i>Filago Germanica</i> , L.	Common.	Ditto, ditto, fl.	
<i>Xanthium Strumarium</i> , L.	Rare.	July Augt. fl.	<i>Baggidri, Punj</i> .
<i>Berthelotia lanceolata</i> , DC.	Abundant where saline and dry.	Nov. fl.	<i>Sáruai</i> .
<i>Franseria cuspida</i> .	Occasional.	Nov. March fl.	<i>Sutei</i> .
<i>Adenocaulum</i> sp.	Not uncommon at water.	July, Nov. fl.	
<i>Isula graveolens</i> .	Abundant.	Sept. Oct. fl.	
<i>I. Eupatorioides</i> , DC.	At 3,500 feet.		

<i>Polycaria Vulgaris</i> ?	Occasional.	Nov. fl.	<i>Lakhtei</i> ; <i>Poli</i> , Punj.
<i>Cousinia calcitrapæformis</i> , DC.	Not uncommon.	April, May fl.	
<i>C. sp.</i> ?	Rare.	March fl.	
<i>Trichogyne cauliflora</i> .	Common.	Ditto, ditto.	
<i>Aploxaxis candidans</i> .	Occasional.	March, April fl.	<i>Káljóri</i> , Punj.
<i>Bidens cernua</i> , L.	Rare.	Oct. Nov. fruit.	<i>Túrpana</i> .
<i>Plagnalon denticulatum</i> .	Ditto.	Nov. fruit.	
<i>Matricaria</i> , sp. ?	Occasional.	March fl.	
<i>Barkhausia</i> , sp. ?	Not uncommon.	Ditto, ditto.	<i>Li</i> , Punj.
<i>Echinops</i> , sp. ?	Not common.		
<i>Senecio</i> , sp. ?	Rare.	March fl.	
<i>Microlonchus</i> , sp. ?	Occasional.	June fl.	
<i>Erigeron</i> , sp. ?	Ditto.		
<i>Utricularia</i> , sp. ?	Rare.	March, July fl.	
<i>Samolus Valerandi</i> , L.	Occasional.	March, Nov. fl.	
<i>Anagallis arvensis</i> β <i>Cœrulca</i> .	Common.	Feb. fl.	
<i>Reptonia buxifolia</i> , A. DC.	Common at foot of hills and to 3,000 feet.	Nov. fruit.	<i>Gúrgúra</i> .
<i>Myrsine Africana</i> , L.	3,000 feet.	Nov. fr.	(<i>Shamshád</i> ; <i>Bebrang</i> , Hindi.
<i>Olea Europæa</i> , L.	Plain to 4,500 feet.	Augt. Nov. fruit ?	<i>Khwan</i> ; <i>Káw</i> , Punj.
<i>Jasminum revolutum</i> Sims β <i>pubigerum</i> .	3,000 feet.		<i>Náugei</i> .
<i>Nerium odorum</i> , L.	Common by streams.	May, Nov. fl. ?	<i>Gándra</i> ; <i>Kaner</i> , Hindi.
<i>Rhazya stricta</i> , DC.	Abundant.	Feb. March fl.	<i>Gandere</i> ; <i>Vena</i> , Punj.
<i>Orthanthera viminea</i> , Wright.	Rare.		<i>Mova</i> ?
<i>Calotropis procera</i> , R. Br.	Abundant.	March, Nov. fl.	<i>Spulmei</i> .
<i>Pergularia pallida</i> .	Rare.		<i>Barrarra</i> .
<i>Periploca aphylla</i> , Dne.	Abundant at foot of hills.	April fl.	<i>Ambarvel</i> , Punj.
<i>Pentatropis microphylla</i> .	Rare.	Augt. fl.	
<i>Dæmia extensa</i> , R. Br.	At 1500 to 2000 feet.	April fl.	{ <i>Pamanne</i> , <i>pasavne</i> ; <i>cháúj</i> ,
<i>Boucerosia</i> , sp.	Occasional.	Augt. fl. ?	Punj. <i>panjangasht</i> Per-
<i>Oxystelma esculenta</i> ?	Rare.		
<i>Buddica asiatica</i> , L.	Ditto.		
<i>Erythraea Centaurium</i> , Pers.	Common.		
<i>E. sp.</i>	Occasional.	June, Nov. fl.	

Name of Plant.	Frequency.	Period of flower or fruit.	Pushtu name.
<i>Limanthemum cristatum</i> , <i>Cris.</i>	Common in marshes.	Nov. April fl.	{ <i>Rebdoon, regdāwan</i> ; <i>Rohāra</i> , Punj.
<i>Tecoma undulata</i> , <i>Don.</i>	Common stunted.	April fl.	
<i>Convolvulus pluricaulis</i> , <i>Chois.</i>	Not uncommon.	Oct. fl.	{ <i>Zarbutei banansha</i> ; <i>Nila-</i> <i>turi</i> , Punj.
<i>Convolvulus arvensis</i> , <i>L.</i>	Abundant in fields.	March, Augt. fl.	
<i>Ipomœa sessiliflora</i> , <i>Ketz.</i>	Not uncommon.	Sept. Oct. fl.	{ <i>Paighambari phul</i> , <i>Shishk</i> .
<i>Pharbitis nil</i> , <i>Chois.</i>	Rare.	Augt. fl. ?	
<i>Evolvulus alsinoides</i> , <i>L.</i>	Occasional.	Feb. fl.	{ <i>Khabarra</i> ; <i>Shumshād</i> , <i>sag-</i> <i>gar</i> , Punj.
<i>Cuscuta reflexa</i> , <i>Roeb.</i>	Common.	Oct. &c. fl.	
<i>Heliotropium ramosissimum</i> , <i>Sieb.</i>	Abundant.	Augt. Oct. fl.	{ <i>Kansafsafei</i> . <i>Warāmba</i> , <i>maraghāne</i> . <i>Kattāl</i> .
<i>H. brevifolium</i> , <i>Wall.</i>	Common.	July, Nov. fl.	
<i>H. Europæum</i> , <i>L.</i>	Abundant.	Augt. Nov. fl.	{ <i>Khabarra</i> ; <i>Shumshād</i> , <i>sag-</i> <i>gar</i> , Punj.
<i>Trichodesma indicum</i> , <i>R. Br.</i>	Common.	March fl.	
<i>Noumea</i> , sp.	Occasional.	Ditto ditto.	{ <i>Kansafsafei</i> . <i>Warāmba</i> , <i>maraghāne</i> . <i>Kattāl</i> .
<i>N. Edgeworthii</i> , <i>DC.</i>	Common.	March, April fl.	
<i>Arachis echinoides</i> , <i>A. DC.</i>	Common.	April fl.	{ <i>Khabarra</i> ; <i>Shumshād</i> , <i>sag-</i> <i>gar</i> , Punj.
<i>Ruellia stellulata</i> , <i>Reich.</i>	Ditto.	June, July fl.	
<i>Lycopsis arvensis</i> , <i>L.</i>	Not uncommon.	Oct. fl.	{ <i>Kansafsafei</i> . <i>Warāmba</i> , <i>maraghāne</i> . <i>Kattāl</i> .
<i>Cynoglossum micrantha</i> ?	Occasional.	Oct. Nov. fl.	
<i>C. sp.</i>	Ditto.	March, June fl.	{ <i>Khabarra</i> ; <i>Shumshād</i> , <i>sag-</i> <i>gar</i> , Punj.
<i>Lithospermum arvense</i> , <i>L.</i>	Abundant in fields.	March, April fl.	
<i>Anchusa</i> , sp. ?	Not uncommon.	Augt. Nov. fl. and fr.	{ <i>Kansafsafei</i> . <i>Warāmba</i> , <i>maraghāne</i> . <i>Kattāl</i> .
<i>Ehretia aspera</i> , <i>Roeb.</i>	Occasional on cliffs; common at 2,500 feet.	Nov. fl. and fr.	
<i>Solanum nigrum</i> , <i>L.</i>	Common.	Augt. Oct. fl.	{ <i>Kansafsafei</i> . <i>Warāmba</i> , <i>maraghāne</i> . <i>Kattāl</i> .
<i>S. Jacquinii</i> , <i>Willd.</i>	Occasional.	Nov. June fl.	
<i>Withania somniferum</i> , <i>Dun.</i>	Common.		

<i>W. coagulans</i> , <i>Dun.</i>	Abundant.	Nov. Feb. fl.	<i>Spín bijja</i> , <i>shd pyang</i> , <i>khamazare, panúúád</i> , Pers.
<i>Physalis viminea</i> , <i>Rox.</i>	Common in fields.	Oct. Nov. fl. and fr.	
<i>Hyoscyamus pusillus</i> , <i>L.</i>	Rare.	April fl.	
<i>Datura alba</i> , <i>Nees.</i>	Occasional.	July, Oct. fl. and fr.	
<i>Scopolia pœalta</i> , <i>Dun.</i>	Very rare.	March, fl.	
<i>Mimulus gracilis</i> , <i>Benth.</i>	Common.	Oct. fl.	<i>Toradád.</i>
<i>Scrophularia Cabulica</i> , <i>Benth.</i>	Not uncommon.	Nov. March fl.	<i>Khardag?</i>
<i>Herpestis Moninera</i> , <i>H. and K.</i>	Abundant at water.	Oct. Nov. fl.	
<i>Linaria ramosissima</i> , <i>Wall.</i>	Common on cliffs.	Ditto ditto ditto.	
<i>L. Cabulica</i> , <i>Benth.?</i>	Not common.	April, Nov. fl.	
<i>Veronica anagallis</i> , <i>L.</i>	Abundant at water.	Most of year fl.	
<i>V. agrestis</i> , <i>L.</i>	Abundant.	Feb. March fl.	
<i>Celsia Coromandeliana</i> , <i>Vahl.</i>	Occasional.	Feb. fl.	
<i>Mazus rugosus</i> , <i>Lour.</i>	Abundant in fields.	March fl.	
<i>Antirrhinum orontium</i> , <i>L. β</i> <i>Indicum.</i>	Not uncommon.	Ditto ditto.	
<i>Leptorhabdos parviflora</i> , <i>Benth.</i>	4,000 feet.	Oct. Nov. fl.	<i>Khar kharnar, spín kharnár.</i>
<i>Verbascum Thapsus</i> , <i>L.</i>	Occasional.	Oct. fl.	
<i>Lindenbergia</i> , <i>sp.?</i>	Ditto.	Augt. Oct. fl.	
<i>Scrophulariaceæ?</i>	Rare.	Oct. Dec. fl.	
<i>Dieltipera Roxburghiáná</i> , <i>Nees.?</i>	Common among bushes.	July, Oct. fl. and fr.	
<i>Barleria cristata.</i>	Rare.	March, Nov. fl.	<i>Tora bijja, blackkar, Punj.</i>
<i>Adhatoda vasica</i> , <i>Nees.</i>	Abundant.	Oct. Nov. fl.	
<i>Rostellularia</i> , <i>sp.</i>	Common in fields.	Oct. Nov. fl.	
<i>Vitex negundo</i> , <i>Rox.</i>	Abundant.	Oct. Nov. fl.	
<i>Lippia nodiflora</i> , <i>L.</i>	Abundant where damp.	March, Nov. fl.	
<i>Verbena officinalis</i> , <i>L.</i>	Abundant.	Nov. April fl.	<i>Manvande warmande.</i>
<i>Lantana alba</i> , <i>Mill.</i>	Rare 18,200 feet.	Augt. fl.	
<i>Anisomcles ovata</i> , <i>R. Br.</i>	Rare.		
<i>Mentha incana</i> , <i>Willd.</i>	Abundant at water.	June, Nov. fl.	<i>Velanne.</i>
<i>Lamium amplexicaulo</i> , <i>L.</i>	Common in fields.	Feb. March fl.	
<i>Eremostachys laciniata</i> , <i>Bunge.</i>	Very rare.	March fl.	
<i>Lallemantia Royleana</i> , <i>Benth.</i>	Abundant.	March, April fl.	
<i>Leucas cephalotes</i> , <i>Spr.</i>	Abundant in fields.	March, Sept. fl.	
<i>Lycopus Europæus</i> , <i>L.</i>	Common at water.	April, Nov. fl.	

Name of Plant.	Frequency.	Period of flower or fruit.	Pushtu Name.
<i>Salvia pumila</i> , Benth.	Abundant in dry shingly.	July, Nov. fl.	
<i>S. lanata</i> , Rox.	Occasional.	March, April fl.	
<i>S. glutinosa</i> , L.	In hills at — feet.	July fl.	Kharnár.
<i>S. plebeia</i> , R. Br.	Abundant in irrigated fields.	May, June fl.	
<i>S. Moorcroftiana</i> .	Occasional.		
<i>Micromeria biflora</i> , Benth.	Very rare in plain, common at 4,000 feet.		
<i>Ballota limbata</i> , Benth.	Common on dry heights.	May fl.	Spínaghzáí.
<i>Ajuga parviflora</i> .	Common.		Khárbánei.
<i>Nepeta</i> , sp.	2,000 feet.		
<i>Colebrookia oppositifolia</i> .	Occasional.	Oct. Nov. fl.	Shakarlaná.
<i>Plectrauthus rugosus</i> .	3,000 feet.		Khawangere.
<i>Tenarium</i> , sp.	Rare.	Oct. fl.	
Labiatae.	Occasional.	July fl.	
do.	Rare.		
<i>Plantago arenaria</i> , W. and K.	Abundant.	Nov. March fl.	
<i>P. lanceolata</i> , L.	Rare.	March fl.	
<i>P. bauphula</i> , Edgew.	Abundant.	Ditto.	Spíghacol, Punj. isafgol, Hindi.
<i>P. eriantha</i> ?	Common.	April, May fl.	
<i>P. Major</i> .	Rare.	June, Nov. fl.	Ghuzhba, bartung, Punj.
<i>Salvadora</i> , sp.	Common towards base of hills.		Plevan, plevane, van, Punj. pátu, Hindi.
<i>Giesckia linearifolia</i> , Schum.	Rare.	Oct. fl.	Jau sáye.
<i>Cheopodium album</i> , L.	Abundant.	Feb. Nov. fl.	
<i>C. hybridum</i> , L.	Ditto.		
<i>C. Botrys</i> .	Not uncommon.	June fl.	
<i>Anabasis multiflora</i> , Moq.	Abundant.	June, Oct. fl.	Ghalne.
<i>Suaeda fruticosa</i> , Moq.	Ditto ditto.	March, Nov. fl.	Zamáí.
<i>Pandertia pilosa</i> , F. and M.	Ditto ditto.	Sept. fl.	

Name of Plant.	Frequency.	Period of flower or fruit.	Pushu Name.
<i>Pouzolzia</i> , sp.	Rare.	March fl.	
<i>Cannabis sativa</i> , <i>L.</i>	Common in waste places.	May, Oct. fl.	
<i>Pinus longifolia</i> , <i>Rox.</i>	At 3,500 feet on north side of valley.	Dec. young fruit, April old ditto.	<i>Nakhtar.</i>
<i>Asparagus</i> , sp.	Common.	July, Nov. fl. and fr.	<i>Vel, Kuchan, Punj.</i>
<i>A. racemosus</i> , <i>Rox?</i>	Rare.		
<i>Butomus umbellatus</i> , <i>L.</i>	Not uncommon in water.	July fl.	
<i>Sagittaria sagittifolia</i> , <i>L.</i>	Common in water.	Nov. April fl.	
<i>Alisma Plantago</i> , <i>L.</i>	Not uncommon ditto.	July fl.	
<i>A. reniforme</i> , <i>Don.</i>	Rare ditto.	July fl.?	
<i>Tulipa stellata</i> , <i>Hook.</i>	Abundant in fields.	March fl.	
<i>Allium leptophyllum</i> , <i>Wall?</i>	Profuse ditto.	March, April fl.	
<i>Asphodelus fistulosus</i> , <i>L.</i>	Occasional.	Ditto, ditto.	<i>Shandāi.</i>
<i>Juncus articulatus</i> , <i>L.</i>	Ditto.	April fl.	
<i>J. bufonius</i> , <i>L.</i>	Very rare.	Ditto, ditto.	
<i>Commelynnum communis</i> , <i>L.</i>	Not uncommon.	April fl.	
<i>Zeuxino sulcata</i> , <i>Lind.</i>	Abundant in fields.	March fl.	
<i>Iris</i> , sp.	Abundant in water.	Fl never got.	<i>Dila gandāchar.</i>
<i>Hydrilla verticillata</i> .	Uncommon in water.	Oct. fr.	
<i>Valisneria spiralis</i> .	Common.	Nov. fr.	
<i>Potamogeton perfoliatus</i> , <i>L.</i>	Not uncommon.		
<i>P. crispus</i> , <i>L.</i>	Common.	Nov. fr.	
<i>P. granicus</i> , <i>L.</i>	Ditto.	Nov. fr.	
<i>P. natans</i> , <i>L.</i>	Occasional.	Nov. fr.	
<i>Zannichellia palustris</i> .	Abundant, low hills, &c.	June, July fl. and fr.	
<i>Charaops Richiana</i> , <i>Griff.</i>	Profuse in water.	July fr.	<i>Mzare.</i>
<i>Typha angustifolia</i> , <i>L.</i>	Rare.	Ditto, ditto.	<i>Lākh.</i>
<i>T. latifolia</i> , <i>L.</i>	Abundant.	July, Sept.	
<i>Scirpus minor</i> .	Common.	July.	
<i>L. trisulca</i> .	Not common.	Augt. Oct. fl.	
<i>Cyperus ciliatus</i> , <i>L.</i>			

<i>Aristida setacea</i> , <i>Retz.</i>	Common.	April, Oct. fl.	<i>Spinvege.</i>
<i>A. sp.</i>	Rare.	Nov. fl.	
<i>Heteropogon contortus</i> , <i>R.</i> and <i>S.</i>	Occasional.	Augt. fl.	
<i>Andropogon gryllus</i> , <i>L.</i>	Abundant.	July, Oct. fl.	<i>Warbushai, Kharawash.</i>
<i>A. Bladhi</i> , <i>Retz.</i>	Ditto.	March, Nov. fl.	
<i>A. involutus</i> , <i>Stend.</i>	Rare.	Augt. Oct. fl.	
<i>Chrysopogon Arnottianum</i> ?	Occasional.	Augt. fl.	
<i>Pennisetum dichotomum</i> , <i>Del.</i>	Rare.	Oct. fl.	
<i>P. araneosum</i> , <i>Edgew.</i>	Occasional.	Ditto.	
<i>P. cenchroides</i> , <i>Rich.</i>	Abundant.	Nov. fl.	<i>Bushke.</i>
<i>Chloris villosa</i> , <i>Pers.</i> ?	Common.	April, May fl.	
<i>Eragrostis cynosuroides</i> , <i>R.</i> and <i>S.</i>	Ditto.	April, Nov. fl.	
<i>E. poaeoides</i> , <i>Beauv.</i>	Ditto.	June, Nov. fl.	
<i>Rothboellia hirsuta</i> , <i>Vahl.</i>	Not uncommon.	Ditto, ditto.	
<i>R. glabra</i> , <i>Rox.</i>	Common at water.	June, Sept. fl.	
<i>Cymbopogon Ivarancusa</i> , <i>Schult.</i>	Common.	April, July fl.	<i>Ghuvargá, drámbi.</i>
<i>Arundo Karka</i> , <i>Rox.</i>	Ditto.	Sept. Nov. fl.	<i>Kaé.</i>
<i>Saccharum exaltatum</i> , <i>Rox.</i> ?	Ditto.	Oct. fl.	
<i>S. four other</i> , <i>sp.</i>	More or less common.	July to Dec. fl.	
<i>Panicum maximum</i> , <i>Jacq.</i>	Not uncommon.	July, Oct. fl.	
<i>P. coloum</i> , <i>L.</i>	Abundant.	Augt. Nov. fl.	<i>Shamákha.</i>
<i>P. repens</i> , <i>L.</i>	Occasional.	Nov. fl.	
<i>Digitaria sanguinalis</i> , <i>Pers.</i>	Abundant.	Augt. Nov. fl.	
<i>Setaria glauca</i> , <i>Beauv.</i>	Ditto.	March, Nov. fl.	
<i>Dactyloctenium Aegyptiacum</i> , <i>Willd.</i>	Not uncommon.	Augt. Oct. fl.	
<i>Koeleria cristata</i> ?	Common.	March, April fl.	<i>Spin wákhei.</i>
<i>K. phleoides</i> .	Ditto.	Ditto, ditto.	
<i>Poa annua</i> , <i>L.</i>	Not uncommon.	Ditto, ditto.	
<i>P. sp.</i>	Common.	June, Nov. fl.	
<i>Agrostis alba</i> , <i>L.</i>	Ditto.	April, Nov. fl.	
<i>A. sp.</i>	Occasional.	Augt. fl.	
<i>A. sp.</i>	Ditto.	March, Nov. fl.	
<i>Cynodon dactylon</i> , <i>L.</i>	Abundant.	Most of year fl.	<i>Baracá.</i>
<i>Eleusine flagellifera</i> , <i>Nees.</i>	Common.	April, Oct. fl.	
<i>E. sp.</i>	Occasional.	Augt. Nov. fl.	

Name of plant.	Frequency.	Period of flower or fruit.	Pashtu Name.
<i>Polypogon Monspeliensis</i> , <i>L.</i>	Common where damp.	June, Nov. fl.	
<i>Lamarekia aurea</i> , <i>Maench.</i>	Common.	April fl.	
<i>Alopecurus pratensis</i> , <i>L.</i>	Common in fields.	April, May fl.	
<i>Avona fatua</i> , <i>L.</i>	Not uncommon in fields.	April fl.	
<i>Phalaris Canariensis</i> , <i>L.</i>	Common in fields.	Ditto, ditto.	
<i>Bromus mollis</i> , <i>L.</i>	Common.	Ditto, ditto.	
<i>Imperata Koenigii</i>	Abundant.	April, Nov. fl.	
<i>Nardus stricta</i> ?	Not uncommon.		
<i>Pappophorum</i> , <i>sp.</i>	Occasional.	June, Nov. fl.	
<i>Sorghum Halepense</i> .	Common in fields, &c.	July, Nov. fl.	
<i>Lappago biflora</i> , <i>Retz.</i>	Rare.	Augt. fl.	
<i>Apluda aristata</i> .	Ditto.		
<i>A. geniculata</i> , <i>Retz.</i>	Not uncommon.	Sept. Nov. fl.	
<i>Isachno</i> , <i>sp.</i>	Occasional.	Augt. fl.	
<i>I. sp.</i>	Not uncommon.	Sept. Nov. fl.	
<i>Opismenus stagninus</i> , <i>Kuntz.</i>	Common in ditches, &c.	June, Nov. fl.	
<i>Paspalum Kora</i> , <i>Willd.</i>	Rare.	Oct. Nov. fl.	
<i>Lolium temulentum</i> .	Not uncommon in fields.	May, June fl.	
<i>Hordeum</i> , <i>sp.</i>	Rare.	March, April fl.	
<i>Festuca</i> , <i>sp.</i>	Not uncommon.	March fl.	
<i>Stipa</i> , <i>sp.</i>	Rare.	May, June fl.	
<i>S. sp.</i>	Ditto.	June fl.	
<i>Anatherum muricatum</i> .	Not common, local.	Oct. fl.	
<i>Melica</i> , <i>sp.</i>	Rare.	Nov. fl.	
<i>Cyperus rotundus</i> , <i>L.</i>	Profuse in irrigated fields, &c.	June, Nov. fl.	
<i>C. exaltatus</i> , <i>Retz.</i>	Abundant in water.	July, Nov. fl.	
<i>C. mucronatus</i> , <i>Roth.</i>	Abundant.		
<i>C. niveus</i> .	Not uncommon.	Augt. fl.	
<i>C. capillaris</i> , <i>Ram.</i>	Abundant.	July, Nov. fl.	
<i>C. difformis</i> , <i>L.</i>	Common.	June, Nov. fl.	

C. Haspan ?	Not uncommon.	Nov. fl.	Kútzei.
Fimbristylis ovalis, Nees.	Rare.	Ditto. fl.	
F. dichotoma, Vahl.	Common.	Nov. March fl.	
F. sp.	Ditto.	July, Nov. fl.	
F. sp. ?	Occasional.	Nov. fl.	
Eriophorum comosum, Wall.	Not uncommon to 2,500 feet.	Augt. Nov. fl. ?	
Malacochaete pectinata, Nees.	Abundant.	June, Nov. fl.	
Eleocharis palustris, Br.	Ditto.		
Scripus maritimus, L.	Ditto.		
Carex Wallichiana, Presc.	Not uncommon.	March, July fl.	
Cyperaceæ.	Rare.		Bandakei.
Do.	Not uncommon.		
Do.	Occasional.		
Do.	Not uncommon.		
Do.	Common.		
Adiantum Capillus Veneris, L.	Abundant in edges, ditches, &c.		
Pteris longifolia.	Occasional.		
Lastreæ Thelypteris, Presl. ?	Ditto.		
Marsilea quadrifolia, L.	Profuse in water.		
Salvinia, sp. ?	Rare.	July, Oct. July.	
Azolla.	Ditto.		
Marchantia, sp.	Abundant.		
Equisetum debile, Rox.	Ditto.	Sept. Nov. fl.	
Riccia fluitans.	Ditto.	July, Sept.	
R. natans.	Common.		
A. chara, nitella (?) a conferva, a moss, and 2 plants of doubtful N.			
Orders, all more or less common.			

The number of plants in the foregoing list amounts to 467, of which 348 are dicotyledonous, 105 monocotyledonous, and 14 acotyledonous, and these are distributed in about 320 genera, and 95 natural orders; thus the natural orders are to the genera as 1 to 3.45, and to the species as 1 to 4.91.

377 out of the whole species have been specifically identified, but of these must be excluded 8 species with regard to the general distribution of which I have not sufficient data to render them available for *any* calculations as to the geographical relations of the Peshawur Flora.

Of the 369 species thus left to be dealt with in this connexion, 188 belong to the ordinary Indian Flora, while those plants which are found at various heights in the Himalaya, amount to 123, 39 species being common to both the Himalaya and the plains.

One circumstance which comes out strongly in the examination of the plants of Peshawur, is that here in the plains a great many species, (many of them European.) are indigenous, which to the Eastward of the Punjab are only found in the Himalaya (or at similar heights in the Neilgheries, &c.) It has long been familiarly known that a considerable number of European species of herbaceous plants inhabit the plains of the N. W. Provinces. These generally flourish "in the cold season," to use Dr. Royle's phrase, but with regard to many of them, *spring* is the season of active growth, as I have been able to verify by observation during the early months of 1861, 1862 and 1863. All of these extend also into the Punjab, and the circumstance with which we are now concerned, goes to prove what otherwise would appear very likely, viz. : that the further North West we proceed, the greater is the number of (European and) Himalayan plants found in the plains. I shall here give a list of those plants which, near Peshawur, I have found below 1500 feet above the sea-level, but which have not been found in the plains of the North West Provinces, (to the East of the Sutlej)—many of them, so far as my information goes, having been found at such low elevations in the extreme North West Punjab only;—but my means of obtaining data regarding the distribution of many of even the Indian species of plants, have, from my isolated position, and the want of libraries, &c.,—been so limited, that I have doubtless inserted some plants which ought to be excluded from this list.

Of the 68 species, those marked B. are British, those marked E. are found in other parts of Europe, while the rest are Himalayan plants.

- B. *Ranunculus arvensis*, *L.*
- R. lætus*, *Wall.*
- ? Adonis *æstivalis*, *L.*
- E. *Ceratocephalus falcatus*, *Mænk.*
- B. *Lepidium ruderales*, *L.*
- E. *Malcolmia africana*, *R. Br.*
- Goldbachia lævigata*, *DC.*
- Euclidium Syriacum*, *DC.*
- B. *Sisymbrium Sophia*, *L.*
- E. *Neslia paniculata*, *Desv.*
- B. *Arenaria serpyllifolia*, *L.*
- Sageretia oppositifolia*, *Brongn.*
- Rhamnus virgatus*, *Rox.*
- Rhus Kakrasinghi*, *Royle* (*acuminata*, *DC.*?)
- B. *Medicago maculata*, *Willd.*
- B. *Trifolium repens*, *L.*
- ? B. *Lotus angustissimus*, *L.*
- B. *Rubus fruticosus*, *L.*
- R. lasiocarpus*, *Sm.*
- Grislea tomentosa*, *Rox.*
- B. *Herniaria hirsuta*, *L.*
- B. *Sium angustifolium*, *L.*
- B. *Tillæa muscosa*, *L.*
- B. *Galium aparine*, *L.*
- ? B. *G. tricornis*, *With.*
- ? B. *Asperula cynanchica*, *L.*
- B. *Taraxacum officinale*, *Wigg.*
- ? *Gnaphalium multiceps*, *Wall.*
- Lactuca auriculata*, *Wall.*
- Koelpinia linearis*, *Pall.*
- B. *Centaurea calcitrapa*, *L.*
- ? *Aplotaxis candicans*, *DC.*
- B. *Bidens cernua*, *L.*
- B. *Samolus Valerandi*, *L.*
- Olea Europæa*, *L.*

- Nerium odorum*, *L.*
 ? *Orthanthera viminea*, *Wight.*
 B. *Lithospermum arvense*, *L.*
 Lantana alba, *Mill.*
 ? *Eremostachys laciniata*, *Bunge.*
 Lallemantia Royleana, *Benth.*
 B. *Lycopus Europæus*, *L.*
 ? *Salvia pumila*, *Benth.*
 S. lanata, *Rox.*
 S. Moorcroftiana, *Wall.*
 Micromeria biflora, *Benth.*
 ? *Ajuga parviflora*, *Benth.*
 B. *Plantago lanceolata*, *L.*
 ? *Gieseckia linearifolia*, *Schum.*
 E. *Chenopodium Botrys*, *L.*
 E. *Atriplex laciniata*, *Moq.*
 Rumex hastatus, *Don.*
 ? *Salix Babylonica*, *L.*
 B. *Populus alba*, *L.*
 Ficus Roxburghii, *Mig.*
 B. *Alisma Plantago*, *L.*
 A. reniforme, *Don.*
 Tulipa stellata, *Hook.*
 Allium leptophyllum, *Wall.*
 B. *Juncus articulatus*, *L.*
 ? *Cymbopogon Iwarancusa*, *Schult.*
 B. *Poa annua*, *L.*
 B. *Phalaris Canariensis*, *L.*
 B. *Bromus mollis*, *L.*
 Eriophorum comosum, *Wall.*
 Carex Wallichiana, *Presc.*
 B. *Lastræa Thelypteris*, *Presl.*
 Riccia fluitans, *L.*

The number of British species found in the Peshawur valley amounts to 100, being a very large proportion of the number of species (Hooker and Thomson give 222) common to Britain and India, and of this number the following twenty species have not,

so far as I am aware, been hitherto found in the Himalaya, or in the plains to the East of the Punjab.

- Sisymbrium Irio, *DC.*
- Lepidium Draba, *L.*
- Frankenia pulverulenta, *L.*
- ? Euphorbia Helioscopia, *L.*
- E. Peplus, *L.*
- Erodium maritimum, *L. Her.*
- E. cicutarium, *L.*
- ? Cichorium Intybus, *L.*
- Lycopsis arvensis, *L.*
- Plantago major, *L.*
- Suæda fruticosa, *Moq.*
- Chenopodina maritima, *L.*
- ? Salsola Kali, *L.*
- ? Typha latifolia, *L.*
- Lemna minor, *L.*
- Digitaria sanguinalis, *Pers.*
- Koeleria cristata, *Pers.*
- Agrostis alba, *L.*
- Alopecurus pratensis, *L.*
- Nardus stricta, *L.*

The number of Central and Southern European species of plants, (exclusive of such as are also found in Great Britain) included in the Peshawur Flora, is 61.

African species, continental and insular, occurring in the Peshawur valley, amount to 146, and it is worthy of note that among these are 11 out of 14 identified Peshawur Cyperacæ, and 30 out of 44 Grasses.

Of the Peshawur species, 101 have been found in the region comprising the Caucasus, Asia Minor, Syria and Persia.

The species of Siberia, Mongolia, and Central Asia (north of Tibet) are 59, of which 43 are common also to the last section.

The Arabian species amount to 41, of which 18 are found in the Persian region also.

The species collected at Peshawur, and common to it with Affghanistan, Beluchistan and Sind, are 47, of which the following appear

not to have been as yet found elsewhere than in these three regions, excepting one or two which are indigenous also in some parts of the Punjab, Cis-Indus.

Papaver cornigerum, *Stocks*.

Crotalaria Burhia, *Ham*.

Reptonia buxifolia, *A. DC*.

Withania coagulans, *Dun*.

Scrophularia Cabulica, *Benth*.

Linaria Cabulica, *Benth*.

Plantago eriantha, *Dne*.

Anabasis multiflora, *Moq*.

Caroxylon Griffithii, *Moq*.

Chamærops Ritchiana, *Griff*.

The following 32 are characteristic Punjab species, many of which extend to the more arid tracts near Delhi, some even (as *Cocculus Leæba*) to dry parts of the Peninsula, and of which many are also found in Arabia or Africa, while a few (as *Fagonia cretica*, *Plantago arenaria*, and *Forskählea tenacissima*) extend to the South of Europe.

Cocculus Leæba, *Forsk*.

Oligomeris glaucescens, *Dne*.

Cleome Ruta, *Jacq*.

C. linearis, *Stocks*.

Mollugo Cerviana, *Seringe*.

Crozophora tinctoria, *Juss*.

Fagonia Cretica, *L*.

Peganum Harmala, *L*.

Acacia modesta, *Wall*.

Carthamus oxyacantha, *Bieb*.

Filago Germanica, *L*.

Berthelotia lanceolata, *DC*.

Franeœuria crispa, *DC*.

Pulicaria vulgaris, *Gærtn.* ?

Trichogyne cauliflora, *DC*.

Rhazzya stricta, *Dne*.

Periploca aphylla, *Dne*.

Dæmia extensa, *R. Br*.

Tecoma undulata, *Don*.

Heliotropium Europæum, *L*.

H. brevifolium, *Wall.*
Nonnæa Edgeworthii, *DC.*
Scopolia præalta, *Dun.*
Ballota limbata, *Benth.*
Plantago arenaria, *W. & K.*
P. bauphula, *Edgew.*
Forskählea tenacissima, *L.*
Cenchrus echinatus, *L.*
Pennisetum dichotomum, *Delile.*
P. arancosum, *Edgew.*
P. cenchroides, *Rieh.*
Chloris villosa, *Pers.?*

A few of the Peshawur plants, 36, are found also in China or Japan, but of these many are of very wide distribution throughout the world, and the same remark applies to 78 species that are common to Peshawur and Australia, as well as to 97 species that occur also in America, continental or insular.

Of the 369 Peshawur species, 135 are found in at least three out of the five great divisions of the globe. Of these, however, a considerable proportion do not extend, in Africa and Europe, far from the Mediterranean, so that although occurring in three continents, they are not so widely distributed as the mere statement of the latter fact would appear to indicate.

The results of the above may be thus briefly stated; Indian species, 188; Himalayan, 123: common to the plains of India and the Himalaya, 39; Himalayan, which have been found in the plains to the west of the Sutlej only, 68; British species, 100, of which 20 have not been found to the east of the Sutlej; of South Europe, 61; African, 146; of Caucasus, Asia Minor, Syria or Persia, 101; of Siberia and Central Asia, 59, of which 43 occur also in the preceding section; Arabian, 41, of which 18 are common also to Persia, &c.; of Affghanistan, Beluchistan and Sind, 47, 10 of these being peculiar; of Punjab and arid tracts of India, 32; of China and Japan, 36; Australian, 78; American, 97; and occurring in at least three of the five continents, 135.

I shall conclude this already too lengthy paper by some remarks on a few of the species individually, noting those circumstances

in regard to their frequency, the uses to which they are put, &c., which seem to deserve attention.

Ceratocephalus falcatus does not appear to have been previously found anywhere at the plain level in India, and I only got a very few plants on one occasion in the Peshawur district, at a place where I failed altogether to find it in the succeeding season. It occurred abundantly in central Waziristan, north west from Dehra Ismail Khan, at about 7,000 feet above the sea.

Delphinium penicillatum is common in the lower hills round the valley, but as my specimens were lost, it is not included in the list.

Cocculus Laeba is a common plant, but only on dry precipitous banks, where also (I might almost add where only) *Capparis spinosa* and *Ehretia aspera* are very generally found.

Immense quantities of *Nelumbium speciosum* grow in one part of the Peshawur marsh, where it has probably been introduced, and to which myriads of its flowers give a very gay appearance in July. The right of collecting the seeds and roots (the latter dug in October) is leased out, both being eaten by natives.

The (new ?) species of *Malcolmia* is in many parts of the valley an abundant weed, and the widespread masses of its pretty purple-lilac flowers have attracted the notice of the European residents, by whom it is frequently called "heather." I have seen it as far east as Hussan Abdál, but it is not contained in an extensive collection of plants, made by Dr. J. E. T. Aitchison, at and near Jhelum. Specimens of it as well as of *M. Afriana*, frequently occur with white flowers. The species of *Notoceras* is also common and may be new. It is a small, inconspicuous herb.

I cannot find that *Euclidium Syriaeum*, *Alyssum ealycinum*, *Sisymbrium Sophia* or *Neslia paniculata* have previously been collected in the plains anywhere to the east of the Sulimán range. Near Peshawur, all except the two last, are with *Malcolmia Afriana*, abundant.

Oligomeris glaucescens is by no means common, nor are *Cleome Ruta*, *C. droserifolia*, and *C. linearis*, as I only knew of one or two stations where each of these could be found.

Capparis aphylla (*Sodada decidua*, Forsk.) though not universal, is in some parts of the district abundant.

Flüggea virosa was not found in the valley, the only tree I saw in that neighbourhood being *Cis-Indus*, but it occurs frequently beyond the Indus to the South of Peshawur.

Grewia oppositifolia is probably the plant (in Pushtu *pastawane*, literally "soft tree") mentioned by Vigne as that from which the inhabitants of the Sulimán range make their bows. It is frequent Trans-Indus, and is the *dúman* of the Punjab, where its elastic wood is used for making buggy-shafts, banghy-sticks, &c.

Dodonæa Burmanniana is one of the most characteristic plants of the dry rocky lower ranges to 4000, feet, Trans-Indus. It is a very handsome evergreen shrub, and does admirably for hedges. This plant is often called "bog-myrtle" by Europeans, why I know not.

Peganum Harmala is probably the most common of the larger herbaceous plants from Peshawur to Dehra Ismail Khán, and is doubtless the species "like Devil in the Bush," alluded to by Elphinstone as common near Peshawur, and surmised by Royle (appendix to Vigne's Kashmir) to be *Nigella*—*sativa*.

The *Haplophyllum* was only found in one spot, in one season.

Celastrus parviflora is one of the characteristic plants of the dry tracts near the base of the hills; it grows to be a largish shrub.

The new (?) species of *Sageretia* (*múmání*) is also very common in similar places to the last, and throughout the Trans-Indus hills generally to 4,000 feet. Its fruit which is not unlike the bilberry, is small, but when fresh is pleasant and sweet. It is the *maimunna* of Griffiths and is well-known in the bazars of Peshawur and Affghánistán.

Under *Rhamnus virgatus* have probably been confounded two species, one (or both) of which is common on most of the Trans-Indus hills.

Of *Rhus Kakrasinghee* (*acuminata*?) in Pushtu *shne*, I have only seen a very few trees beyond the Indus; Griffith hints at the *shne* (*schnee*) of Affghánistán being a *Xanthoxylon*. This name has at different times been applied by Affgháns to each and all of the species of *Rhus* and *Pistacia* that I have ever shewn them. The present species produces beautifully marked wood—the *Kakkar* of the Himalaya—for furniture, desks, &c.; and is subject to the growth of large, red, fleshy excrescences upon its leaves (as is also the case with *Pistacia Cabulica* or *Atlantica* in Belúchistán, according to Stocks,) which are employed medicinally by the natives.

Crotalaria Burhia was not met with in the Peshawur valley, although it is common near Campbellpore, a few miles to the east of Attock, and abundant at many places to the south of Peshawur. The

fibres of its bark are of great strength, but I am not aware of this property being taken advantage of for economical purposes.

Acacia modesta is an abundant and characteristic shrub. Its flowers in spring have a most agreeable and powerful odour, easily felt at a distance of many yards to leeward of a bush in full blossom; and it furnishes good but very small timber, suitable for making ploughs, &c.

Medicago maculata and *Trifolium repens* do not appear to have been previously found in the plains of India, but the one is common and the other occasional near Peshawur and in the Trans-Indus districts generally.

Acacia catechu and *Butea frondosa* might have been included in the list of Peshawur Leguminosæ, as they were collected (though both are very rare) in the district. They have, however, been excluded, as the specimens were lost at Nowshera—with the other results of my first two seasons botanizing in the valley—in the flood of the Cabul river, caused by the great Indus cataclysm of 1858.

On two occasions only were very young plants of *Rubus lasiocarpus* found, in the beds of streams, and they may have been seedlings accidentally brought down from the hills.

Trapa bispinosa is by no means common and has possibly been introduced.

Grislea tomentosa was found only close to the Swát river near its débouchement from the hills.

Tamarix orientalis is one of the trees very commonly planted about villages, &c., and I am not sure that I have ever seen it wild. It is a very handsome tree and *looks* a shady one (indeed, Elphinstone alludes to its shade as being extremely sombre,) but in reality, its slender, rod-like branches, with very minute leaves, afford a most inadequate defence from the sun, as experience soon teaches the frontier campaigner. Its wood is of little value.

The only Compositous plant that seems to require special notice is *Carthamus oxyacantha* which is abundant throughout the valley. An oil is extracted from its seeds which is both burned and used in cookery. Its parched seeds are eaten, and when ground, they are made into bread which is considered very nutritious. Col. Sykes gives similar information with regard to the uses of the allied *Carthamus* (*Onobroma*) *Persicus*.

I may remark that here, as elsewhere in the Punjab and in the N. W. Provinces, *Anagallis arvensis* is always the variety β *cærulea*, while every specimen I saw in the valley of Kashmir, had the usual scarlet corolla of the British plant.

Reptonia buxifolia is a large shrub common towards the skirts of the hills, and to 3,000 feet, throughout the Trans-Indus districts. Its wood is small but hard and fine grained, and its fruit is the well-known *gurgura* of the Affghans, collected in April for sale, but which is miserable eating, and by no means deserves their panegyrics.

Olea Europæa is very common, Trans-Indus, as well as throughout the Western Punjab, in similar situations to the last. It is a small tree, furnishing a good deal of strong hard wood used for making agricultural implements, and for the kneed timbers of boats, &c. The supply for the Government boat-yards at Attock is brought chiefly from the direction of Níláb. Elphinstone mentions that its fruit is eaten both fresh and dried, by the Sheraunees, but I could discover no trace of such an usage among the Affgháns, and the amount of fleshy pericarp is very much less than in the European olive.

Rhazzya stricta is here (as further east in the Punjab) a characteristic shrub, being so abundant in some parts of the valley that its dried branches are commonly used as fuel. It seldom exceeds 2 or $2\frac{1}{2}$ feet in height, and its resemblance to the oleander (noted by Vicary in his paper on the Sind Flora, J. A. S.) accounts for its Pushtú name being a modification of the Hindustáni name of the latter.

Periploca aphylla, which occurs as far east as the hills north of Jhelum (and in the Salt range near that place where it was first found in India by Jacquemont), and which is common in most places Trans-Indus (to Sind, see Vicary) is so abundant in some parts of the valley, as to be in common use as fuel. In one place, Cis-Indus, the young shoots are eaten as *ság*.

The species of *Boucerosia*, not yet determined (I have only been fortunate enough to get it once in flower and fruit) has a distribution similar to that of the *Periploca*, than which it is, however, very much less abundant. The appearance of its bunches of short tetragonal stems has suggested its Persian name *panj angusht*, five fingers, and one of its Punjábí names *chár angli*, four fingers. Its taste is intensely bitter, and as in the case of most plants which have a very decided flavour, salutary effects are attributed to it by Patháns and Punjabis,

by both of whom it is eagerly eaten. This is probably Griffiths' "Stapelioides, eaten as a vegetable" found by him in the Khyber Pass and appears to be the plant alluded to by Masson (Vol. II. p. 80) which however he calls "a lichen."

Tecoma undulata is not uncommon in the Peshawur valley as elsewhere, Trans-Indus. It has by far the largest corolla of any wild plant I collected in the Punjab, and its gorgeous orange-coloured blossoms present a striking appearance in April and May.

Cuscuta reflexa is by no means rare, and is the only parasitical plant found in the plain near Peshawur. (*Viscum album* is, however, evidently common above a certain height in the hills around, as it was at once recognized and named, both fresh and dried, by Tíra men, who stated it to be frequent in their country).

A yellow-flowered variety of *Heliotropium Europæum* (or a different species?) was only got in two places, and is probably the "*Heliotropium flavum*" found by Griffith near Jellálabad.

The unnamed species of *Nonnæa* (flower white, that of *N. Edgeworthii* being rose-coloured in all my specimens,) I only found in successive seasons in one field where it was abundant.

Arnebia echioides is common near Peshawur, as elsewhere beyond the Indus, and in March and April its pretty yellow flowers enamel the ground in many places where it occurs in profusion. It has a pleasant smell, and under the name of the "Prophet-flower" is held in much esteem by the Affgháns (but not to the south of the Trans-Indus salt range so far as I could learn) who attribute the five dark spots upon its corolla to the pressure of Mahomed's fingers. I do not know of its having been found to the East of Hussan Abdál, there being some doubt as to specimens collected near Jhelum by Dr. Aitchison, but its congener *A. hispidissima*, which occurs in the Kohát Pass, is common in Rohilkhund, and is enumerated by Dr. Anderson in the flora of Lucknow.

Lithospermum arvense is an abundant field-weed in spring, and *Lycopsis arvensis* occurs sparingly in waste places.

Ehretia aspera is frequently found, Trans-Indus, on dry precipitous banks, but always much more stunted than in the lower North-West Himalaya.

Withania coagulans is an abundant small shrubby plant and extends eastward at least to Jhelum. Its Persian name *panír bád*

implies, and information received from Dr. Bellew regarding the practice at Candahar, authenticates its occasional use in Affghanistán as a coagulant, but this does not appear to be the case at Peshawur. Masson mentions its seeds as being useful in colic, &c., and this seems probable from the known sedative effects of *W. somniferum*.

Hyoscyamus pusillus was only found, in successive years, in one place, where it was pretty common in several fields.

Of *Scopolia præalta* only one plant was found near Peshawur, but I have frequently got it at places further to the south.

It is rather singular that although *Solanum gracilipes* is common beyond the Indus about Kohát and to the south, (as in the Cis-Indus salt range when Jacquemont originally collected it) it was nowhere got in the Peshawur valley.

The species of *Dicliptera* is abundant in shady spots every where, Trans-Indus, and *Adhatoda vasica* is, near Peshawur, as elsewhere in the Punjab and North West Provinces, a very common plant.

Mentha incana is profuse by canals, &c. In one spot many plants occurred having each spike contracted into a quasi-capitulum.

Of *Eremostachys laciniata*, in successive seasons, no more than a single plant was to be found.

Ballota limbata is common in dry rocky places near the skirts of the valley. It extends eastward at least to Jhelum.

Of *Plantago bauphula* there are two tolerably distinct varieties, both of which are abundant. Both *Plantago major* and *P. lanceolata* are very rare, and only found near water; while *P. eriantha* (?) is common in the most arid spots.

Salvadora is frequent towards the base of the hills. In some places, Trans-Indus, powerful aphrodisiac qualities are attributed to the fruit of this plant, but it is probable that the circumstances under which it is collected—where the male and female inhabitants of whole villages turn out into the “jungle” to gather it,—rather than any quality of the fruit itself, afford an explanation of the results attributed to the latter.

No fewer than twelve species of *Salsolaceæ* are found, most of them being very common, near Peshawur, and several additional species were got beyond the Indus to the south of the valley. We may note this in connection with the two or three species of this order found wild in the N. W. Provinces, and the twenty-two species (as given

in Decandolle's Prodrômus) contained in Griffiths' Affghaniistán Herbarium, while in the Siberian Flora, the number is very much larger still. Of those found in the Peshawur district the most common are *Anabasis multiflora*, *Suæda fruticosa*, *Caroxylon Griffithii*, and *Pauderia pilosa*, the last being the tallest and most bushy. So far as I am aware none of the Salsolaceæ are here applied to any use, but I understand that in the arid tracts between Lahore and Múltán, immense quantities of an impure alkali are extracted from the ashes of several of them (known by the general name of *lâne* or *lâna*) for export to other districts.

Ærua Javanica is very abundant, and grows in the driest places, often to upwards of five feet in height. It varies much in habit and in the form and size of its leaves.

Rumex vesicarius is common in dry rocky or shingly situations. *R. hastatus* is only found at some height above the plain.

Thymelæa arvensis is an abundant field weed, with a marked variety less common than the ordinary form.

The species of *Alnus* was only met with near the debouchement of the Swát river from the hills, near which place it is common, but stunted.

Quercus Ilex, I procured from the Khyber Pass where it must be abundant, as its wood is one of the commonest brought in for fuel to the cantonment of Peshawur.

Forskählea tenacissima is not uncommon on dry rocky spots. It varies very much in habit, being sometimes short stemmed, low and scrambling, and at others tall, erect and half-shrubby. Its leaves also vary much according to age, in texture and "tenacity."

Pinus longifolius I have collected at about 4,000 feet above the sea, in the hills to the North-East of the valley, and I procured it from the hills above Abazái towards Swát, where it is said to be abundant. It is notable that there should be none (nor was *Quercus Ilex* met with) on the hills to the south of the valley, which rise to 5,000 feet above the sea. Nor did we reach it on the Wazíri expedition into the Sulímán range North-West of Dehra Ismail Khán, when we attained 8,500 feet, and where its lower limit (forests of it were seen above us, and I picked up its cones in stream-beds)—was certainly not under 9,000 feet. The comparative drought has doubtless much to do with this. The Affghán name of the tree is *nakhtar*,

under which *Cedrus Deodara* also appears to be included. The word *sháutai* (mentioned by Griffith and Irvine) is only applied to its resinous splinters used for torches and firewood.

An undetermined species of *Asparagus* is common here, as in many parts of the Western Punjab; while *A. racemosus* is very rare.

Alisma reniforme occurred only in one spring, which fact may possibly be connected with the temperature of the latter, which is very equable, and always considerably higher than that of the air in winter and spring.

Allium leptophyllum, *Asphodelus fistulosus*, *Tulipa stellata* and a species of *Iris* are all abundant in the fields in spring, when the gaudy flowers of the two last present a very gay appearance.

Of *Commelynium communis* I only found a single plant. *Zcuxine sulcata* is not uncommon in dampish places.

The various species of *Fluviales* are all abundant in most pools or slow running streams.

Chamærops Ritchiana (possibly identical with *C. humilis*, the most northern and only European Palm) is not got close to Peshawur itself where the supply has probably been completely used up—but very large quantities of it are brought in from places a few miles off, where it is gregarious and covers extensive tracts, for the manufacture of mats, ropes and sandals, &c. The hillmen make a tobacco pipe from a single segment of a leaf by twisting it up spirally; and when the ends of all the segments of a leaf are tied together, it is used as a way-side drinking vessel. The mossy looking rete lying inside the base of the petiole is used as tinder for which it answers admirably. Though I have not seen this plant to the East of the Indus, and Dr. Fleming in his Report (in J. A. S.) on the Salt Range, does not mention it as growing there, yet I am informed on good authority that it is found on the top of Sarkesar in that range.

Typha angustifolia is abundant in all marshes but it is superseded as a material for mats, for which it is used in the N. W. Provinces, &c., by the *Chamærops*, from which a much stronger and more lasting article is made. The seeds of the *Typha* are used as a binding material for wall plaster, and to the South of Peshawur, the leaves are employed as thatch.

Of the Peshawur grasses a large number grow in very dry situations and of these the following are the most prominent; *Aristida*

setacea, *Heteropogon contortus*, *Pennisetum cenchroides*, *Chloris villosa* (?), *Rottbœllia hirsuta*, *Andropogon Bladhii*, *Cenchrus echinatus*, *Eleusine flagellifera*, and the species of *Pappophorum*.

The proportion of grasses to the whole of the plants collected in the Peshawur district, about 60 to 460 (more than one-eighth) seems very large when we consider that the number of grasses in the Indian Flora to the total number of Phanerogamous species found in India, including the Himalaya and Ceylon, is given by Hooker and Thomson as about 400 to 12,000 or one-thirtieth. A comparatively large number of grasses were also obtained in the Trans-Indus districts, hill and plain, south from Peshawur to near Dehra Ismail Khán, the proportion to the number of plants collected being more than one-tenth (about 65 to 640).

The Cyperacæ are also numerous at Peshawur, about 20 to 460 species; I am not aware that any of them is applied to any special economical purpose.

Of Ferns, *Adiantum Capillus Veneris* is common on the sides of wells (as it is in the N. W. Provinces, though Royle does not mention it as found there,) and in shady places by ditches, &c.; *Pteris longifolia* and *Lastræa Thelypteris* (?) are both uncommon.

Marsilea quadrifolia and *Equisetum debile* are both profuse in damp places, as are *Riccia natans*, *R. fluitans*, and *Azolla*, floating on, and *Chara*, immersed in water.

In bringing to a conclusion these notes on the Peshawur Flora, I have to express my exceeding regret that owing to various unavoidable causes, so many of the species should still remain unidentified. As among these there will probably be a considerable number new to India, when circumstances permit of their identification, I may beg for admission into the Journal of the Society of a corrected list with remarks, so as to furnish a more complete view of the Flora than is at present possible. Meanwhile I have preferred sending the present imperfect paper, to incurring the indefinite delay that may occur before all the species can be thoroughly compared and named with certainty; knowing as I do from bitter experience, from how much vexation the possession of even such a catalogue as I have been able to give here, would save the tyro in Indian botany who commences his labours in the Upper Punjab.

Remarks on a stone inscription from the ruins of Pu-gán on the Irrawaddy river.—By Lieut-Col. A. P. PHAYRE, C. B. Bengal Staff Corps.

Among the ruins of the city of Pu-gán are numerous ancient inscriptions, generally on slabs of sandstone, which being soft, and the slabs having for centuries been exposed to the weather, the inscriptions have for the most part become much worn, and are now difficult to be read. Many of these inscribed stones have been removed by order of the king of Burmah to the capital. Those which remain at Pu-gán are seldom found in their original places, but have been collected chiefly within the enclosure of one Pagoda called Baudi-Phrá. Some years ago when at Pu-gán I took rubbings of several of the inscriptions, but from want of leisure, have never set seriously to work to decipher them. At length I commenced with one, the date of which was legible, and which had the merit of being short. With the help of two Burmese literati, Moungh Shwé Hlau and Moungh Tá, I have been able to decipher it. The inscription possesses no historical interest, but may be of use as showing the form of letters existing among the Burmese at the time it was engraved, and so be a key to other and more valuable writings. For this reason the original rubbing is sent, and a copy in modern Burmese character, with an English translation, and notes, are added.

The inscription is unsatisfactory, as it does not give even the name of the person making the gifts which it records. Very different in this respect is the conduct of the bestower, to that of the modern Burmese, who take care to record carefully their names when they build a religious or charitable fabric. The language of the inscription is homely Burmese, with such few Pali words as the nature of the subject required. In later times a man would have despised the vernacular, and have recorded his good deeds entirely in flowing Pali. The language is quite intelligible, though the meaning of a few words is still doubtful. Considering that the inscription is now, (in A. D. 1862), six hundred and seventy-three years old, it is wonderful that so few of the words have become obsolete.

The inscription records that the donor from sincere feelings of respect to "the three treasures, Budha, his law and his ministers,"

bestows or presents certain land, and agricultural implements, in order that pure milk, or a preparation of rice-milk, or milk and honey, may be available; and after blessing those who assist in the good work, the inscription concludes with dreadful imprecations on those who destroy it. While the donor is not mentioned, though one word implies a royal benefactor, nothing is even said as to whom the offering is intended for; but perhaps that would have been indecorous, as it was probably a gift to a monastery, and Buddhist monks, not only theoretically must be dependent on daily charity for their food, but must be utterly indifferent to it, except to support life for the purpose of practising virtue. But milk is not taken as food by grown up people in Burmah; or at all events is only lately beginning to be used. Possibly the milk may have been intended for foreign Buddhist monks from Ceylon, who, there is reason to believe, about the time of the inscription, were not unfrequently at Pu-gán.

Some explanatory notes have been added to the inscription. The original consists of eighteen lines, and the copy in modern characters is written to correspond with it.

Copy of the inscription in modern character.

- ၁ သကရစ်၅၅၁သုသရဝန်နှ
- ၂ စ်တပိုင်တွဲဆိုတ်၅ရက်ခါန့အစစ်နှီ
- ၃ စင်ခဲဘုရာတရာသဃ်ရတ္တနာသုပါးတိုင်နှီက်
- ၄ သဒ္ဓါကြည်ညိုဝံ့စွာရွယ်ယူသောနို့တန်းခဲဂုရှာ
- ၅ ကိုင်ရတ္တနာသုပါးအားပစ္စည်းဖျစ်မိမ်သောဌာ
- ၆ အစစ်နှီစင်ခဲလ္လှတ်မူသောမြေကမိင်လယ်အရေနှီက်
- ၇ မိုးအုံဆေချင်အရပ်စင်္ကြံရွာရောက်မြေဝံ့က
- ၈ အနောက်သိုင်းနှင်းကြီးချောင်ပေါက်ရင်နှင်သောလ
- ယ်၅
- ၉ ဝ။စဇေတူသည်မန်ကြွင်၅ဝ။မန်ကြာ၅ဝ။ပျင်၅ဝ

Handwritten text in a script, likely Devanagari, arranged in approximately 15 horizontal lines. The text is highly stylized and appears to be a form of shorthand or a specific dialect. The characters are dense and closely packed, with some larger, more prominent characters interspersed throughout the lines. The overall appearance is that of a manuscript or a document from a historical period.

၁၀ စကြာရေပုၤ၅၀။ချင်ရိစိတ်၁၀။တံကျက်မြေ၅၀။
အပေါင်

၁၁ ၄၁၀။ဤငါပြုသောကောင်မှုကိုစိပ်ပါသောသူကာ။
နှစ်ရေ

၁၂ တျရတိနေရစေရည်ကောင်မှုကိုသွမ်ကြောဖျက်ဆီ
၁၃ နိုင်သောရယူသသူကားမြေကြီးမျှင်စေသော။ မိုးကြိုး
ဇေ

၁၄ သော။ရှင်လူရှာစေသော။ကြာစာစေသော။မိကြောင်
စာဇေ

၁၅ သော ဂနိယံပျက်စေသော။သွေခဲအရုပ်တါစေ
သော။ခံရန်ဘေ

၁၆ လည်ရေခံစသော လုပ်သရာပျက်စိစေသောသေ
စေသောရစ်

၁၇ မူဂရှည်ၤသို ပုတ်နှိဟိဟိမြည်လျက်ဗုရာထုံ

၁၈ ဟိုက်တ တံသောဌမနက်ဘေဖျစ်စေသတေ

Translation of the Inscription.

In the era 551* the Tharawan year, the fifth day of the waning moon Tabodwai, (bearing in mind) the offering of pure milk curds,† made sincerely from a well disposed regard to Phra (Budha) (his) law (and his) ministers, (therefore I in order to provide) milk-curds,

* The existing era of the Burmese, commences with the vernal equinox of the year A. D. 638. All their astronomical knowledge is derived from the Hindus, (or Buddhists of India) and formerly each year used to be designated in succession, by one of the lunar mansions of the Hindu system. Thus in the inscription, the year 551 is called Tharawan, which answers to Sravanah the 22nd lunar mansion of the Hindus. The waning moon Tabo-dwai falls in February. The inscription was executed in the year 1189 A. D.

† Offering of pure milk. The composition of this inscription is, like all ancient, and indeed most modern, Burmese writings, so elliptical, that much of the meaning has to be guessed at. In this sentence it is possible that the offering of *ga-nha*, milk and honey, made to Gautama, after six years of fasting and mortification by Thoodzata is alluded to.

(and) cows,* to be the property of the three treasures, royally bestow† pure milk curds (and) rice-producing land;‡ * * * * in quantity at the place (called) Po-oon-tshay-tsyeng until you reach the village Tsagyo, and from the north to the west until you reach the Nhen-gyee§ stream, (what is) my own (that I) bestow, rice land (in extent) 50;|| digging spades 50; broad spades 50;¶ planks 50;* ploughs 50;† sickle handles divided 110; earth rakes 50;‡ in all 410. This my good work the men who have assisted, may they remain a hundred years; (but) that my good work, the loose destructive men, who would make away with, (it) may the earth swallow (them up); may the thunderbolts strike them; may the clergy and laity avoid them; may tigers devour them; may crocodiles eat them, to-day may they be destroyed; may their blood harden and become corrupt;§ may calamity, enmity, and evil overtake them;|| may all their endeavours come to nought; may they die; with giddiness,¶ may they have a disgusting stench in the body, with distressing skin disease; with shivering,* and may evil follow them day and night.

* The word in the inscription rendered "cows" reads ဝဉ္ဇာ or ခုရာ if the last it may be a Pali word for cow; if the first it is bad spelling for ဝဉ္ဇာ

"honey and milk," or "rice and milk."

† Royally bestow. The word here rendered royally, is in the inscription spelt differently to the present mode of spelling that word; indeed it is an abbreviation not now in use, yet it is difficult to suppose it to represent any other word. At the same time no other phrase in the whole inscription indicates a royal donor.

‡ The word connected with "rice-producing land" left blank in translation as not understood, may be the name of the place where it is situated.

§ It appears there is a small stream at *Pu-gán* still called *Nhen-gyee*.

|| "Rice land fifty." Probably the mere figures at that time sufficiently indicated the area of the land. If they meant the produce in bushels the land might be three or four English acres.

¶ Some obsolete words not understood precede the word "spade."

* Planks are much used in land prepared for irrigation, to preserve the ridges which retain the water.

† The word for plough is obsolete, but I am informed is still known in some parts of upper Burmah.

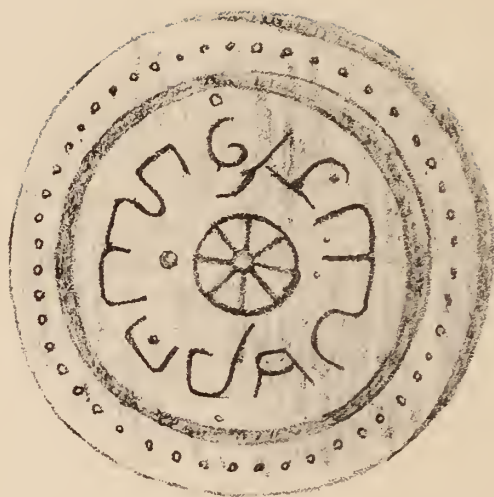
‡ The spelling of the word for rakes differs from that of the present day.

§ Here the stone begins to be broken, "blood become corrupt," the words of the original are doubtful.

|| "Overtake them." The words are inserted from the context where the stone is broken.

¶ After "giddiness" words broken away.

* After "shivering" words broken away.



Memorandum on some medals and coins in the Museum of the Asiatic Society, found near Mergui on the Tenasserim Coast.—By Lieut.-Col. A. P. PHAYRE, C. B., Bengal Staff Corps.

The coins or medals found near Mergui and presented to the Society by Professor Oldham, have nothing to indicate the year when they were cast. Their metal appears to be a mixture of tin and lead. Tin is found in plenty in that part of the country. Possibly some of them may have been made for circulation as money, but that is doubtful. It has never as a general rule been usual to coin money in the Burmese empire for currency. When Arakan was conquered in 1784 A. D. the Burmese Governors issued a coin in imitation of the custom observed by the Kings of Arakan, who again had learnt the practice from the Mahomedan Kings and Governors of Bengal.* It is possible that on the Tenasserim coast within the present districts of Tavoy and Mergui, where tin is found, coins may have been made for general use, more especially as those districts have occasionally belonged to the Siamese, who have copper coins and formerly even stamped glass. It appears to be the opinion of the people of the coast also, that these coins were formerly used as money and as weights. As, however, the large medals, numbers one to six of the plate, contain religious symbols, the fact of their common circulation is doubted by many inhabitants of the northern portion of Burmah whom I have consulted regarding them. It is more probable that they were made for the purpose of being deposited in Pagodas.

There are sixteen large coins in good preservation, which contain only three different varieties. Of the smaller coins only six are sufficiently preserved to be described. None of them contain any date nor any king's name. They are probably recent, that is coined within the last hundred years. I shall now proceed to describe those coins of the collection which are figured on the accompanying plates the exact size of the originals :—

No. 1.—*Obverse*.—The figure of a fabulous animal in the Burmese mythology called ဝိဇ္ဇာ *Tó* or နယာ *nayá* a compound of flying horse and deer.

Reverse.—An inscription in the Pali language, Burmese character as follows :

* See Journal of Asiatic Society, Vol. XV. p. 232.

မဟာသုခိကာဝရံ

Translation. "Land of great happiness," or "great happiness for people of (the) land."

The letters all read backwards from the die having been stupidly prepared without reference to the stamped or cast surface from it, coming out reversed. The inscription surrounds a wheel or circle, the symbol of Budha, "emblematic," says Col. Cunningham, "of the passage of the soul through the circle of the various forms of existence," and here typifying as shown by the inscription the attainment of the great object, nirvána, rest in the happy land.

No. 2.—This coin is from a different die to No. 1, but the device is generally the same. There is no difference in the inscription which is shown reversed.

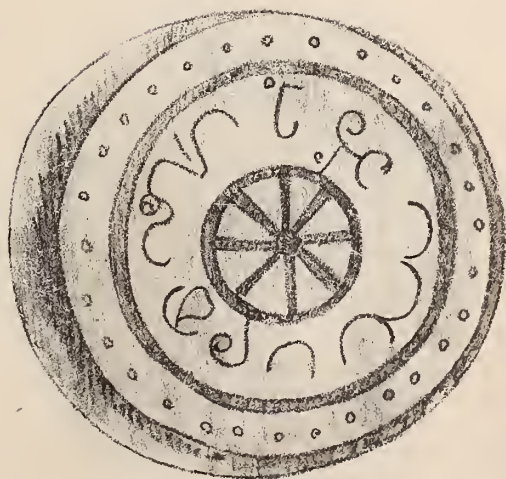
No. 3.—In this medal the animal intended to be represented is the same as in the others; the inscription is also the same; but this time is written correctly. The wheel here has only six compartments there being eight in the others. Each compartment also has a small circle within it.

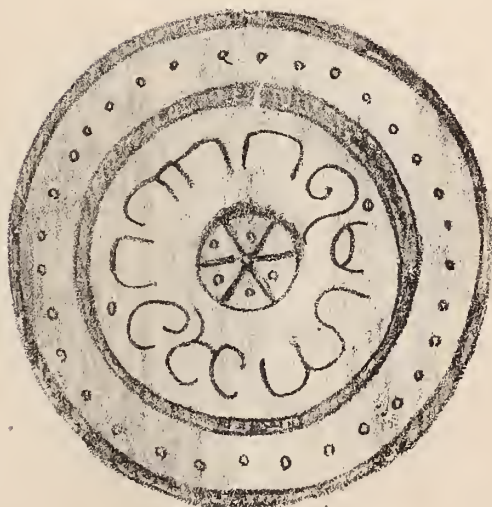
No. 4.—No material difference. Underneath the animal on the obverse, is a six-rayed star; on the reverse, is the same inscription as before, and the central wheel or circle with eight compartments.

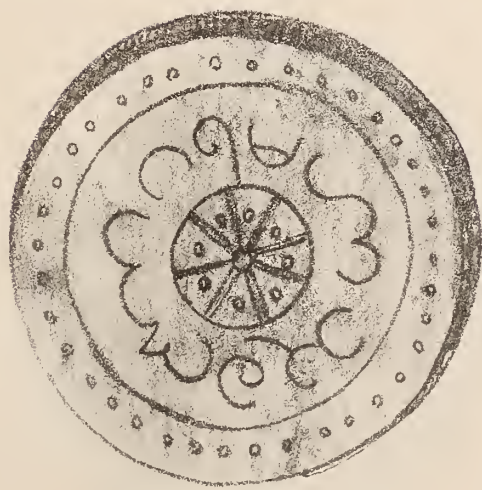
The popular idea among the Burmese regarding these medals is, that they were cast by order of the king called Bau-dau-phra, who reigned from 1782 to 1819 A. D.; that he feared losing the remote maritime province of Tenasserim and trusted to some supernatural power by means of these medals to preserve his province from foreign invasion, and thus secure "great happiness for the people of the country." This is a very far-fetched and unlikely interpretation. I think it much more probable that the medals are the work of a provincial Governor for a local purpose. They appear indeed to be quite unknown to people of good education from upper Burmah, to whom I have shown them.

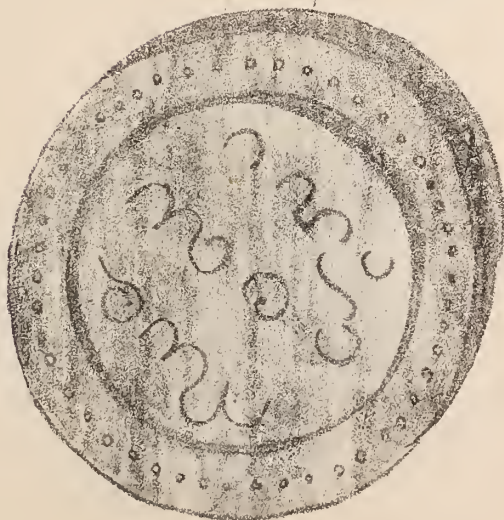
No. 5 is of a different type from the preceding. The obverse is a bird of no earthly form. The reverse bears what appear to be Burmese characters, but of which no meaning can be made.

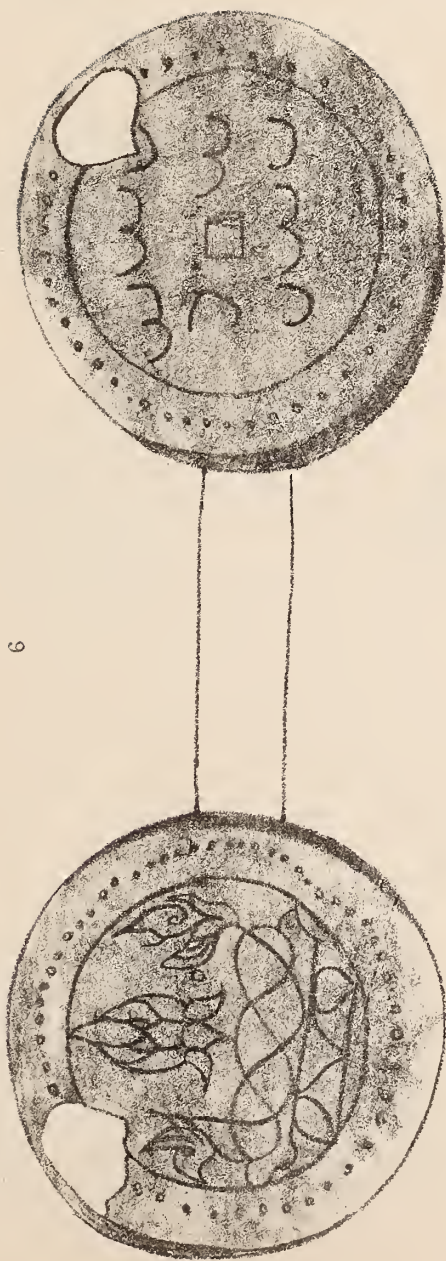
No. 6 is a medal which I am not prepared to explain, but the reverse with the square symbol in the centre is apparently a rude













1111



representation of the chaitya of ancient Buddhist coins with central relic chambers. The obverse may possibly represent a lotus bud.

Of the numerous small coins in the collection only six can be in any way deciphered. These are figured in the plate and marked Nos. 7 to 12 inclusive. The obverse in these coins appears generally to contain a figure meant to represent a lion. In one instance, No. 8, the figure is evidently a humped cow. At first sight the reverse of these coins appears to bear traces of Burmese letters. Indeed some of the marks do make veritable letters of the Burmese alphabet. But no meaning can be extracted from them, and I incline to look on these six small coins, as copies of ancient Buddhist coins made by ignorant workmen, who, in copying the common chaitya symbols, have made random marks like Burmese characters. But the symbols in the coins marked 8 and 11, evidently differ from the rest. I am unable to offer any probable explanation of them.



Two Ancient Sanskrita Inscriptions from Central India ; texts, translations and comments.—By BĀBU RĀJENDRALĀLA MITRA.

In my papers on Toramāpa and the kings of Gwalior I have noticed nearly all of Major General Cunningham's collection of Inscriptions from Central India of which any sense could be made out. Of the few which remained to be decyphered, most were full of lacunæ and otherwise imperfect, and I have therefore returned them to their owner, for such use as he may deem fit to make of them in his forthcoming essay on the history of the celebrated stronghold of the Kachvahas. There were two, however, which were sufficiently legible to admit of trustworthy interpretations ; and transcripts and translations of these I now offer to the readers of the Journal.

The first is from a small Jain temple at Kajraha, nine coss from Chhatterpur, which is on the high road from Saugor to Hamirpur. It is incised on a small slab nine inches square, the lines, eleven in number, being, with one exception, just eight inches long.

Its language is pure Sanskrita, but the metre of its poetical portion is defective, and the spelling throughout incorrect, the dental sibilant being every where used instead of the palatal and the cerebral, and the cerebral being in one place used in the place of a *kh* as in the modern Hindvi.

The subject of the record is the donation, by one Bhabya Páhila, of six small plots of garden land and a house for the use of a temple ; it is dated, Monday the 7th of the waxing moon in the month of Vaisákha, Samvat 1011 = A. D. 954.

When I first read the inscription I took the cypher in the date to be a 7, as I felt it difficult readily to believe, that the modern Devanágari, the character used, could be associated with the Samvat date 1011, but finding the figure 7 differently given at the foot of the record, I had no alternative but to take it for a dot. The idea of 7 was suggested by a twisted tail at the right hand of the cypher which in modern Nágari cannot be expected in any other figure. Its presence, however, has been accounted for by General Cunningham, who says, " I have satisfied myself by personal examination that the figure one was first engraved and afterwards changed to 0."*

The inconsistency regarding the association of so early a date as the tenth century, with very modern characters, General Cunningham explains by assuming the record to be a recent transcript of an ancient document. In a private letter (dated 10th November, 1860) to Mr. A. Grote, commenting on my translation of the inscription, he observes : " Of the short inscription from Kajraha (or Khajuráha) I have little to say. The date has puzzled Rájendra on account of the modern style of the letters ; but the date can only be one of two, either 1011 or 1111, (better 1711). I believe that the inscription may have been engraved any time during the last 300 years, from a more ancient copy. My reasons I will give in detail when giving my note on the Khajuráha kings. I may mention, however, for Rájendra's satisfaction, that I copied in the same Jain temple an inscription, but without date, which is word for word the same as the other down to the enumeration of the gifts. I say word for word, but not letter for letter, as this other shorter inscription has no mistakes in it of one *s* for the other, and is besides in comparatively old characters, on the pedestal of a Jain figure."

The donor, a Jain, calls himself the respected of Rájá Dhánga, and gives away, among several parcels of garden land, a house and premises of the name of " Dhánga báḍi." This would imply him to have been either a near and elder relative of Dhánga, or a priest. The latter is not likely, as a Páhilla, according to General Cunningham,

* Ante XXIX. p. 396.

was the founder of the Dhánga dynasty, and it is therefore likely that the donor with the same name was a member of this family, though there is of course nothing to prevent his being a priest. Any how, as he is neither a royal nor a historical personage, the knowledge of his identity is of little interest to the antiquarian. The fact, however, of his having been a contemporary of Dhánga in 1011 Samvat, settles the chronology of a long line of princes who exercised supremacy in Bundelkhand eight hundred years ago.

The first mention of Dhánga occurs in a record published by the late Lieut. W. Pierce in the 12th Vol. of the Asiatic Researches (p. 357). The document was found inscribed on a large stone in the vicinity of the town of Mhow about ten miles distant from Chatterpur, i. e., very near the same place whence the monument now under notice has been brought. It was mutilated at its beginning and end, owing to the stone having been used for grinding the knives and axes of the neighbouring peasants. Enough, however, was left, to afford a pretty connected account of nine chieftains and their ministers. The first chief of the roll was Dhánga Deva, who, after a long and prosperous reign, destroyed himself by drowning at the holy junction of the Ganges and Jumna opposite Allahabad. The last of his line was Madanavarma, who was, according to his historiocrast, "a conqueror of the glories of Chedi, Kás'í and Málava." The document gives no date, but judging from the circumstance of its having been from the same locality whence our Kajraha stone has been obtained, and from the age of the ruins where they were found, it would not be, for Indian history, too presumptuous, to assume the identity of the Dhángas named in the two records.* But we have more than a presumption to establish their identity. In a large inscription found at Kajraha by Capt. Burt and decyphered by the late Mr. J. C. C. Sutherland,† we have the genealogy of a Kajraha chief named Banga, who, in the Samvat era 1019 = A. D. 962, "consigned his mortal coil to the confluence of the Ganges and Yamuná" at Prayága. Now this Banga can be no other than the Dhánga of our inscription, and I have the authority of General Cunningham, who has examined the original stone, to state that the reading of Mr. Sutherland, owing of course to the imperfection of the facsimiles he

* The credit of discovering the identity is due to General Cunningham, vido Ante, vol. XXI. p. 394.

† Ante vol. VIII. p. 159.

had before him, is defective in many respects, and that his Banga is a mislection of Dhánga. Thus then we have the era of Dhánga established by two inscriptions to be 1011 to 1019 Samvat, in the last year of which he committed suicide. How long before 1011 he had assumed the sovereignty of Kajraha, we have no means to ascertain. His panegyrist assigns him a long life of "109 autumns," a good portion of which he must have spent in the exercise of his sovereign powers; it would not be too much, therefore, to assume that he reigned for at least fifty or sixty years, or Samvat 960 to 1019 = A. D. 902 to 962.* If we allow the usual average of eighteen years to each reign to six of his predecessors, the founder of his family would be placed 852 S. = 795 A. D., and the same average to eight of his successors would bring down the last of his race with whose name we are acquainted, Madanavarma, to S. 1173 = A. D. 1116. This would be, however, too early by two reigns, as the Kajraha inscription of Capt. Burt is dated "Friday, the 3rd of the waxing moon in the month of Vais'ákha S. 1173" = A. D. 1116 when Jayavarma, the grandfather of Madana, caused the eulogium of his ancestor Dhánga to be transcribed from an old and ill-written document into the "Kakuda" or, as correctly guessed by General C. "Kumuda" characters. If allowance be made for this discrepancy, the average of the six reigns after Dhánga would come up to $25\frac{1}{3}$ years, which would be considerably more than the usual average of Indian reigns; but inasmuch as the chieftains of Kajraha were petty kings, or more probably vassals, enjoying from generation to generation the little principality, without being exposed to those vicissitudes which are incident to extensive sovereignty, their reigns should assimilate more to the average of human generation than to Indian reigns. And if this be admitted, thirty to thirty-three years should be assigned to each life rather than twenty-six. At the last named rate, which I accept to be on the safe side, Madana would be removed to the middle of the 12th century, and the chieftains of Kajraha for near four hundred years be thus arranged, the years being of course mere averages except in the cases of Dhánga and Jayavarma's dates.

* General Cunningham says that he has got a long inscription of Dhánga, dated 45 years before his death. The "109 autumns," according to the same authority, is a mislection of "upwards of a hundred autumns." *Satam samadhi-kam*. Ante XXIX. p. 395.

I.—Nannuka,	A. D. 746—771
II.—Vágyati or Vákpati according to General C.,	772—797
III.—Vijaya,	798—823
IV.—Vihala or Ráhila according to General C., ...	824—849
V.—S'ríharsha,	850—875
VI.—Yasodharma Deva, son of V.,	876—901
VII.—Dhánga, son of VI.,	902—962
VIII.—Gāṇḍa Deva, son of VII.,	962—988
IX.—Vidyádharma Deva, son of VIII.,	999—1014
X.—Vijāya Pála, son of IX.,	1015—1040
XI.—Kírtti-varma Deva, son of X.,	1040—1066
XII.—————Varma Deva, son of XI.,	1066—1092
XIII.—Jayavarma* Deva, brother of XII.,	1092—1118
XIV.—Sallakshaṇa Varma, son of XIII.,	1118—1144
XV.—Madanavarma, son of XIV.,	1144—1170

Of the history of these chieftains I shall here say nothing. General Cunningham has lately obtained a Hindví poem, containing a chronicle of the principality of Kajraha, a summary of which, now under his pen, will, I have no doubt, throw much more light on the subject, than any thing that I can compile from the meagre inscriptions at my disposal.

The second inscription is from Ratanpur in the province of Nagpur. It is inscribed on a temple of Mahádeva, and measures 2 feet 6 inches by 14 inches. The face of the stone on which it is recorded, is in a good state of preservation, and perfect facsimiles in intaglio may be taken off, by impressing on it moistened paper with the hand. Col. Cunningham's facsimile has been so prepared, and the depressions have been since filled up with ink, but the operation having been carelessly done, the ink-tracing, instead of proving a help to the reader, often misleads him. In decyphering the record, I have, therefore, followed the relief side which, though reversed, is nevertheless more trustworthy than the former.

The character used for the inscription is intermediate between the Kuṭila and the modern Devanágari, with several letters which seem peculiar to the era of the document. The *t* and the *bh* have been written almost alike, the lower arm of the one being slightly rounded,

* Mr. Sutherland had a notion that Jayavarma was the son of Dhánga, but the inscriptions completely refute his idea.

while in the other it is angular. The *bh* of this type, however, is not invariably used. The Kuṭila *bh*, resembling the modern *h*, is promiscuously used with the former. *B*, *v* and *ch* are written alike. At the end of the first line, which is about $\frac{1}{3}$ shorter than the rest, several characters are scratched at the end, which cannot be made out; probably they were of the same type as those of the rest of the inscription, but owing to partial obliteration they now look different. The second and third lines have several letters of the same kind. The last letter of every line, as also the initial letters of the 22nd, 23rd and 24th lines, are lost.

In regard to style, the inscription offers little for comment. Sanskrit poetry of the later middle ages is noted for its unchaste ideas, silly conceits, and over-strained metaphors; and the author of the record under notice, is in every way true to the age he lived in. An eager attempt to make up for the poverty of ideas by a pruriency of diction, pervades his composition, and the erotic tendency of his thoughts assails him even in his salutation to his gods. The language, however, is generally correct, and there is little to complain of against the engraver Sampula.

The subject of the record is not of much interest. It is said that in the reign of Prithudeva son of Ratnapāla, King of Chedi, modern Rewa and Mundla,* who was a prince of the lunar race, a Brāhmaṇa of great learning came from Chedi to the Turmaṇa country, and one of his descendants, in the year 1150 A. D., dedicated a temple to Ś'iva, in the village of Sāmbāgrāma. The locality of Turmaṇa must be assumed, from the position of the temple, to be the district around Ratnapur, and for the origin of the name, we must look to the prince of the Gwalior inscription published in the last volume, whose dominion extended to the west as far as Bhopal and perhaps farther. By the testimony of the inscriptions and coins extant, it has been there shewn that Toramāna was a prince of some renown, and the association of his name with the country, several centuries after his death, may be taken as an additional proof in support of that opinion.

The name of the dedicator of the temple is indistinct, the syllables *de. va* and *na* are alone legible, with a hiatus after *va* barely sufficient for a single letter, which I suppose was a *g*. If this guess be correct, the name would be Devagaṇa, probably an *alias* of the Devadāsa

* Vide Journal American Oriental Society, vol VI. p. 18.

described in a preceding part of the record. Ráyara Siñha, the sixth in* descent from Gobinda, the founder of the family from Chandail, was probably his father. But the family panegyrist, after naming Bhopá the daughter of Ráyara, celebrates the intimacy of the two brothers Balha and Devadása without saying a word as to their descent. A Devagana occurs as the composer of the record and he is said to be the son of Ratna Siñha, but whether that Ratna Siñha was the son of Máme or a different person, does not appear; probably he was different, as otherwise the recital of three generations after the composer would be scarcely called for; and it would be difficult to account for the poet being, in sad breach of Hindu manners, so very particular as to who was the most favourite wife of his own son, and an octogenarian contemporary of his great-grandson writing erotic poetry.

Kumárapála, son of Avanipála is said to have written the eulogium but whether on paper at the dictation of Devagana, or on the stone for the engraver, the record makes no mention.

Of the family described, nothing is known for certain. They were probably influential residents of Berar, (ancient Bidarbha,) which was once a large and flourishing kingdom, but of the rulers of which we have now no record. The panegyrist no where assigns to them any royal epithet, and their history therefore can be of no interest to the Indian antiquarian. The inscription, however, is of use as supplying three names in the annals of Chedi, and as suggesting the fact of Nagpur and the country around it, having been, in the year of Samvat 1207 = A. D. 1150 and for a time before it, subject to the princes of Chedi; for it is not likely that the writer of the inscription should select the chiefs of that principality for his eulogium, if he had any sovereign of Nagpur or Bidarbha at the time, to make the theme of his praise. The three princes of Chedi named, are Jájalla, Ratna Pála and Prithví Deva, the last of whom was a contemporary of Govinda, the seventh ancestor of the dedicator of the temple, who lived in A. C. 1150.

Transcript of an Inscription from Kajraha.

संवत् १०११ समये ॥ निजकुलधवलौ यो दिव्यमूर्तिः खसीलः (1)
सम(2)दमगुणयुक्तः सर्वसत्त्वानुक्रम्यो । खजनजनिततोषोधांगराजेन

* Govinda; 2, Máme; 3, Ratna Siñha; 4,—? had two wives Jánha and Prathá; 5, Jagat Siñha; 6, Ráyara Siñha; 7, Balha and his brother Devadása alias (?) Devagana.

मान्यः प्रणमति जिननाथो यं भयपाहिलनामा(3) ॥ १ ॥ पाहिल-
वाटिका १ चन्द्रवाटिका २(4) लघुचन्द्रवाटिका ३ संकरवाटिका(5)
४ पञ्चाशतलवाटिका(6) ५ आम्रवाटिका ६ धगवाडि(7) पाहिल-
वंसे(8) तु क्षये क्षीणे अपरवंस्यो(9) यः कोपि तिष्ठति तस्य दासस्य
दासोयं मम दानंस्तु(10) पालयेत्तु(11) ॥ महाराजगुरु स्त्री(12)
वासवचन्द्र वैसाध(13) सुदि ७ सोमदिने ॥

1. सुशील recte.

2. शस recte.

3. The measure is here broken ; पाहिल should be पाहिल.

4. This figure is not legible in the inscription but there is space for it.

5. The sibilant should be a palatal श.

6. The *m* of *Panchámra* is doubtful ; it looks more like an *i*.

7. I originally read this word dhagavátiká, but the last syllable being smudgy, I prefer Major General Cunningham's reading of Bádi. The *dhaga* is clear, though evidently a miscript of Dhánga.

8. वंशे recte.

9. Read वंश्यो for वंस्यो.

10. Read नु for सु.

11. Read पालयेत्तु for पालयेतु.

12. The sibilant should be a palatal.

13. वैशाख recte.

TRANSLATION.

In the Samvat era 1011.

Bhabya Páhila, the ornament of his race, the well-formed, the amiable, he who is possessed of entire controul over his senses and his passions, who is merciful to all created beings and has gratified all his kindred, he who has Jina for his lord, and is the respected of Rájá Dhánga, offers salutations.

Páhilavátiká 1, Chandravátiká 2, Laghuchandravátiká 3, S'ankara-vátiká 4, Panchámratavátiká 5, Ámravátiká 6, Dhángavádí, 7. I shall be a slave to the slave of him of any race, who will, on the decease of the Páhila family, preserve this gift of mine.

Srívásavachandra preist of the Mahárájá. In the month of Vaisákha, Monday the 7th of the waxing moon.

Transcript of an Inscription from Ratanpur, Nagpur.

[N. B.—Letters within brackets are corrections suggested by the transcriber, those within parentheses are suggestions to fill up blanks]

those that are doubtful have marks of interrogation after them. Stars indicate blanks.]

ॐ नमः शिवाय ॥ भोगीन्द्रो नयनश्रुतिः कथमसौ द्रष्टुं [युं] क्षमो
नो भवेदेषा चन्द्रकलो 33 syllables missing.

(२) वं शैलसुताप्रबोधनपरो रुद्रो रते पातु वः ॥ १ ॥ सत्सिन्दूर-
विशालपांशुपटलाभ्यक्तैककुम्भस्थलः सुगडाताण्डवमण्डिताखिलनभोदि-
ङ्गाण्डपाडप 17 syllables missing.

(३) मीरुहयूहोन्मूलनकेलिरस्तु भवतां भूयैगणग्रामणीः ॥ २ ॥ देवः
पीयूषधाराद्रवकरनिकराक्रान्तदिक्चक्रवालस्त्रैलोक्याक्रान्तिनिर्यन्मदन-
न्टपचमूदप्य[र्प्य]णाभोग * : । क्षार * * * * *

(४) यतिसुरवधूरत्नकर्णावतंसः शुभांशुः प्रौढरामाहृदयगिरिगु-
हामानसर्व्वकषश्रीः ॥ ३ ॥ तदंशे भुजदण्डमण्डलमदाक्रान्तत्रिलोकी-
तलो विभाणः सुरसार्थ[र्व्व]नाथपदवीमुद्दामधैर्याम्बुधिः । स * *

(५) निधिमेखलावलियतक्षी[क्षी]णीवध्रुवस्तभो भूपालो भुवनैकभू-
षणमणिर्जाजस्तदेवोऽभवत् ॥ ४ ॥ तस्माच्चेदिनरेन्द्रदुर्दमचमूचकैकवा-
रांनिधेस्तीव्रैर्व्वज्वलनोऽजनिष्टतनयः श्रीरत्नदेवोन्टप[पः] *

(६) व्या?वर्धि?तचो?डु?ग?ङ्ग?सुभटस्फारेन्दुविम्बग्रहग्रासे राजरन-
न्तसौर्यमहिमाश्चर्या महीमण्डले ॥ ५ ॥ सपर्य्यतूर्णशशाङ्कधामधवलस्फाय-
द्यशोजन्मभूरुद्यत्तीव्रतरप्रतापतरणिः सक्षेत्रधर्माम्बुधिः । ना (ना)

(७) यातदिगन्तवन्दिनिवहाभीष्टार्थचिन्तामणिः पृथ्वीदेवनरेश्वरो
ऽस्य तनयः श्रीमानभूद्वृतले ॥ ६ ॥ राज्ये भूमिभुजोस्तैव नयमार्गानु-
सारिणि । क्षीणेपसर्गसंसर्गप्रजानन्दविधायिनि ॥ ७ ॥ वास्तव्यवंश-
शुभां (शु)

(८) गीविन्दश्चेदिमण्डलात् । कृतीकालक्रमेणासौ देशन्तुर्माणमा-
गतः ॥ ८ ॥ पुत्रस्तस्य जनाध[नु]रागजलधिर्भूभृत्सभाभूषणो जीयात्य-
ण्डितपुण्डरीकतरणिर्म्मामेऽभिधानोऽभवत् । यो धात्रीतिलको निजा-
मल (कु)

(९) लालङ्कारहारोपमो विख्यातस्त्रिपुरान्तकैकचरणाम्भोजैकभृङ्गो
भुवि ॥ ९ ॥ भ्राता श्रीराघवोऽमुष्य कनीयान्गुणसागरः । नागरो
भुवनाभोगभूषापूषोपमो वभौ ॥ १० ॥ श्रीमामेतनयः समस्त जग-
तोवि (क्ती)

(१०) र्स्कीर्स्[स्]स्फुरत्तुन्देन्दुयुतिकीर्त्तिसन्ततिलतायासक्तदिङ्म-

गडपः । राजत्युन्मदवादिवृन्ददलनो लीलाविहारः श्रियः शीलाचारवि-
वेकपुण्यनिलयः श्रीरत्नसिंहः कविः ॥ ११ ॥ शचीवर्जिष्णोर्गिरिजेव(श)

(११) भोर्दुग्धाश्रिपुत्रीवच चक्रपाणेः । साध्वी सदा बन्धुजनाभि-
पूज्या रम्भेति नाम्नाऽभवदस्य पत्नी ॥ १२ ॥ ता[त]स्यामजायत जगच्चय-
घुष्टकोर्त्तिराखण्डतारिबुधमण्डलचण्डदर्पः । चण्डोश्चारुचरणाम्बुज-
चञ्चरीकः प्रज्ञःप *

(१२) * रिहदेवगणस्तनूजः ॥ १३ ॥ एतद्यस्य जगद्यशोभिरभिते-
डिण्डीरपिण्डाम्बुभैराकान्तं धवलं विलोक्य निखिलं गोपाङ्गनावीक्षित-
तः । कालिन्दीऋदकालनेमिदलनप्रारम्भवीतादरस्तीरे ताम्यति वा-
रिराश्रितनया *

(१३) जोऽपिजातममः ॥ १४ ॥ पीयूषद्रवसान्द्रविन्दुवसतिर्यस्यास्य
वाक्चन्द्रिका विद्वद्वक्त्रचकोरचञ्चुपुटकैरापीड्यमानानिष्टम् । किञ्चाय
[यं] करपञ्जरोखिलमिलन्नानादिगन्तार्थिनां । भूयो भीष्टफलप्रदान-
चतुरश्चाधीश (क)

(१४) ल्यद्रुमः ॥ १५ ॥ चन्द्रिकेव शिशिरांशुमालिनो मञ्जरीव
सुरमेदिनीरुहः । कान्तिनिर्जितसुराङ्गनागणा तस्य साधुचरिता
वधूः प्रया ॥ १६ ॥ जान्तेनाम्नो द्वितीयास्य विलासवसतिः प्रिया ।
अमितप्रेमवाज्जल्याद्वि (ती)

(१५) यं प्राणमन्दिरम् ॥ १७ ॥ लावण्याप्रतिमल्लतामदभरामौ-
लीन्दुना क्रोधतो दग्धस्यापि मनीभवस्य भुवने विधेव सङ्गीवनी । स-
त्त्वौभाग्यगुणैकगर्व्ववसतिः प्राणाधिका प्रेयसीयां निर्मायसरोजभूः
प्रमुदि (तः)

(१६) प्राप्तः परां निवृ[र्त्त]तिम् ॥ १८ ॥ अवोधध्वान्तरुन्तानकवि
[रि]कुम्भविदारणः । जगत्सिंहोस्य तनयः सिंहवद्भुवि राजते ॥ १९ ॥
तारकारिरसौ शैलसुतास्तनुरयं पुनः । सुतोरायरसिंहोऽस्य बन्धुवर्गस्य
तारकः ॥ २० ॥

(१७) भोपास्य दुहिता साध्वी कलिकालविचेष्टितैः । अस्पृष्टा
स्वर्धुनीवेयं भुवनत्रयपावनी ॥ २१ ॥ वाल्मश्रीदेवदासाख्यौ बद्धस-
ख्यौ परस्परम् । जगदुद्योतकौ भातः पुण्यवन्ताविवाम्बरे ॥ २२ ॥ वा-
तोद्धति (वि)

(१८) लोलतूलतरलं नृणामिदं जीवितं लक्ष्मीं घोरघनान्तराल
विलसद्दिद्युदिलासोपमाम् । मलैतदुरितौघदारुदहनप्रोहामदावा-
नले अडामुद्धतधर्मबुद्धिरकरोच्छेयःपथे साश्रते ॥ २३ ॥ चक्रदेव *

(१६) शोधाम विव्वपाणिपिनाकिनः । सांवाग्रामे तुषाराद्रिसि
[शि]खराभोगभासुरम् ॥ २४ ॥ नानाभूपालभुक्तक्षितिजघनघनाश्लेष-
तोषादिवादौ दिग्गामाकामपीडातरलतनुगुरुश्लेषलिप्तं समन्ता (त्)

(२०) कामीवेदम्बिदग्धो विरचितपरमप्रेमहासंत्वरवत्सुर्व्यासाणां
समक्षं गगनपरिसरश्रीमुखं चुम्बतीव ॥ २५ ॥ निःशेषागमशुद्ध-
बोधविभवः कायेषु यो भयधीः सत्तर्काम्बुधिपारगो भृगुसु (तो)

(२१) यो ? दण्डनीतौ मतः । कुन्देलङ्घृतिशब्दमन्मथकलाशाखाङ्गच-
ण्डद्युतिश्चक्रे देवगुणः प्रशस्तिममला[लां] श्रीरत्नसिंहात्मजः ॥ २६ ॥
यः कायकौरवविकाशनशीतरश्मिरुद्धामबद्धिनिलयोऽव

(२२) (नि) पालसूनुः । विद्याविंलासवसतिर्विमलां प्रशस्तिं
श्रीमानिमां कुमरपालबुधो लिलेख ॥ २७ ॥ प्रशस्तिरियमुत्कीर्णा
रुचिराक्षरपंक्तिभिः । धीमता सूत्रधारेण सांपुलेन मनोरमा ॥ २८ ॥

(२३) * * * वगणावेतौ रूपकारशिरोमयी । चक्रतुर्घटनां धाम्ना-
विव्वपाणिपिनाकिनः ॥ २९ ॥ चन्द्राक्षौ किरणावलीवल्लितं याव-
द्विधत्ताङ्गगद्दिङ्मातङ्गघटोपहृत्तधरा चक्रच्चञ्च ? *

(२४) * * * कचप्रकरोरुहारलतिकाऽलङ्कारसारं नभस्वत्की-
र्त्तिर्मदनारिमन्दिरमिषातावाच्चिरं नन्दतु । ३० ॥ सम्बत् १२०७ ।

Translation.

1. *Om* ; salutation to S'iva. The king of snakes hears by his eyes ;
how can he fail to see the moon * * * * * May Rudra, thus
awakening the daughter of Salya for dalliance, protect you. * * *

2. With his frontal globes besmeared with a profusion of powder-
ed pure red-lead, and his pliant trunk covering all space with its
dances† * * * * * May the great among the Ganas prove propi-
tious to you !

3. The god whose nectar, flowing from his numerous arms, covers
all space, and whereupon the army‡ of Eros (Madana) sallies forth
* * * * * the moon which is like a jewelled ear-ring of the ladies of

* The stanza is incomplete and therefore the connection of the sleeping
goddess with the visual organ of snakes which is supposed by the Purāṇics
to be the seat of their hearing, cannot be ascertained.

† An allusion to the elephantine head of Ganes'a. The stanza is incomplete.

‡ The *bhramara*, a large black bee noted for its sweet murmuring hum, and
supposed, from its appearance in the commencement of spring, to heighten the
pangs of separation in love-sick maidens.

heaven, which expels from the inmost recesses of the hearts of mature females the feeling of anger against their lovers* * * * *

4. In his race was born king Jájalla Deva, an immeasurable ocean of patience, the only great jewel that ever decorated the brow of this sublunary sphere. The might of his wand pervaded the three worlds. He assumed the title of the lord of the Súra, and became the favorite of his mistress the sea girt earth.

5. From that mighty sovereign of Chedi, who with his invincible army was like unto an ocean, proceeded Sri Ratnapála his son, who was fierce as the submarine fire Bádavánala† * * * * * a Rahu‡ to eclipse the moon-like countenance of heroes—a wonder on the face of the earth for endless might and glory.

6. He is the birth-place of expansive renown. Radiant as the hoary orb of the full moon—a rising sun of unbounded majesty—an ocean of Kshetria virtues—he is an all-yielding gem§ to the bards who flock (round him) from all quarters. Unto him was born Prithudeva the lord of mankind.

7. When the dominion of this sovereign was ruled according to the principles of polity, when approach of evil portents had been minimised, and the people lived in peace,

8. There came in the fulness of time to the Turmána country from the regions of Chedi, Govinda the pious (or active?) of the race of Vástavya, pure as the moon.

9. Unto him was born a son of the name of Máme. He was an ocean of philanthropy, an ornament for the decoration of royal courts, a sun to the lotus of wise men.|| May he live long in prosperity! He was the pride of his nurse and a garland to his pure race. The renowned, the only bee extant on the lotus feet of the destroyer of regions (S'iva and—)

* The princes named in this inscription evidently belonged to the lunar race, but owing to a hiatus in this stanza, the name of the particular branch of that race from which they descended, cannot be made out.

† Nine letters at the beginning of the second half of the stanza are unintelligible.

‡ “The ascending node; in mythology, the son of Sinhika a Daitya, with the tail of a dragon, whose head was severed from his body by Vishnu, but being immortal, the head and tail retained their separate existences, and being transferred to the stellar sphere, became the authors of eclipses; the first especially by endeavouring at various times to swallow the sun and moon.” Wilson.

§ *Chintamani* a fabulous gem, the possession of which is supposed to yield its possessor whatever may be desired.

|| I. e. as gratifying is the sun to the lotus so is he to wise men.

10. His younger brother Sri Rághava was a prodigy of merit. Gallant (in his bearing,) an ornament of creation like the sun (Pusha).

11. The son of Sri Máme was the poet Sri Ratna Siñha. The arms* of his mighty deeds, spread, scattered and refulgent everywhere, white as the light of the Kunda† flower or the moon, have enveloped the earth. He flourishes, the trampler of his excited opponents, the pleasure ground of fortune, the receptacle of urbanity, good conduct, wisdom and virtue!

12. The name of his wife was Rambhá. Chaste and adored by her friends, she was to her husband what Sachí‡ is to Indra, the mountain-born Girijá to Sambhu,§ or the daughter of the ocean to the wielder of the discus.||

13. She bore a son renowned in all the three regions of the universe, who had eclipsed the high pride of his enemies, as well as of the learned, and was like unto a bee at the beautiful lotus-feet of Chandí and Isa.¶

14. The earth around was enveloped by his fair fame bright as the foam of the sea. Milk-maids observing that wide-spread whiteness and mistaking it for the churning of the Kalíndí with the serpent Kálanemi.* * * * *

15. Clustering drops of melted nectar dwelt in his speech, which was as charming as the moon, and the mouth of the learned, like the beak of the Chakora,† pecked at them without intermission. His hands were the cage in which dwelt, (birdlike,) the beggars who crowded around him from various quarters. He was a royal‡ tree of desire,§ which was well fitted to gratify this desire in profusion.

16. His wife was the well-behaved Prathá, whose beauty had overshadowed the charm of goddesses. She was like unto the light of

* Lit. The creeper *latá*.

† *Jasminum pubescens*, Willd. *J. hirsutum*, Linn.

‡ Wife of Indra.

§ Durgá, daughter of the Himálaya mountain and wife of S'iva.

|| Lakshmi produced by the churning of the ocean, and Vishnu whose chief weapon is a discus.

¶ Durgá and Mahádeva.

* The last part is unintelligible. Kálinđí is the river Jumna, so called on account of her blue waters.

† A bird unknown to modern ornithology, but supposed by Indian poets to hover around the moon and live upon the nectar that exudes from the orb of that luminary. The word is also used to indicate the *Tetrax rufus* vel *Perdix rufa*.

‡ *Adhisa* in the original; the epithet is of doubtful application.

§ *Kalpádruma* a fabled tree which yields whatever may be sought of it.

the orb of soothing rays,* or the blossom of the favourite tree† of the gods.

17. His second object of enjoyment was the favourite Jáhno. From exuberance of love, (he had made her) a second abode for his life.

18. In loveliness she was an ivy‡ without compare. Proud as being the elixir which restored the life of him (Hindu Eros) who had been consumed by the anger of Siva, she was the boastful residence of all fortunate qualities. Dearer than life was she, the lovely. Brahmá, having designed her, felt satisfied, and gave up all farther desire for creation.

19. His son was Jagatsiñha, who lived on the earth like a lion, to break the frontal orbs of the elephant of ignorance.

20. (As such) he was like the son of Salyasutá and the enemy of Táraka.§ His son was Ráyera Siñha a defender of his friends.

21. His daughter was Bhopá, chaste, bereft of the vices of the Kaliyuga, and like the heavenly river Ganges, a purifier of the world.

22. Báha and Devadása|| were united together by the ties of friendship, and as radiant on earth as are the virtuous in heaven.

23. Life is unstable as cotton fleece before a breath of wind, and fortune is to be compared to the play of lightning between masses of heavy clouds. Knowing this, that virtuous man turned his attention to that eternal and benign path, which is like unto a blazing fire to the forest of sins.

24. In the village of Sámhá, (or at Sámhágráma,) Deva—na dedicated to the holder of the Bilva¶ and the dread trident Pináka, (S'iva) a temple bright as the brow of a cloud-capped mountain.

25. The temple, as if excited by the deep embrace of the earth, the abode of many kings, and bent on continuous dalliance with the nymphs of the quarters, seemed, like a love-stricken swain, to kiss the charming face of heaven in the presence of celestial damsels.

* The moon.

† Párijáta, like the *kalpadruma*, a mythical creation. It is typified as a tree of extreme beauty and its flowers are supposed to possess the most exquisite fragrance.

‡ Lit. a creeper.

§ Kártikaya god of war, son of Siva and Durgá, called Tárakárí from having killed a giant named Táraka.

|| These two were probably sons of Ráyara Siñha. The latter evidently is the same with the Deva-na of the 22nd stanza, but not the poet Devaguna named in the 26th stanza as that would make the geneology uncalled for. Owing to the loss of a syllable, the name cannot be made out, the letters Deva na alone exist.

¶ *Ægle marmelos*, the favorite tree of S'iva.

26. Devagaṇa, son of Śrī Ratna Sīṅha, whose wealth consisted of the pure knowledge of the Śāstras, whose genius in poetry was vast, who was proficient in logic and renowned for versification, rhetoric, lexicography, the art of love, and other branches of learning, who was like the son of Bhrigu, (S'ukra,) in the administration of the criminal law, even he composed this chaste eulogium.

27. He who was like unto the moon in developing the lily* of poetry, he who was the store-house of intelligence, and the pleasure-ground of learning,—even he, the auspicious Kumarapāla, son of Avāṇipāla, wrote this chaste eulogium.

28. And the charming composition was engraved in beautiful letters and lines, by the intelligent carpenter (stone-cutter?)† Sampula.

29. * * * * Vagana, the two great manifestoes of forms, erected this temple of Pinákī, the holder of the Bilva.

30. As long as the sun and the moon will hold the earth enveloped in their beams * * * * as long as the elephant, of the quarters will—* * * * and the heaven will be embellished with—* * * * so long and for ever shall the memory of his deeds last under pretence of this temple to the enemy of Cupid‡—Samvat 1207.

* The Kumuda a lily that opens at night.

† Sutrādhāra in Sanskrita, from which comes the modern Bengali word, *chhutār* a carpenter. According to the dictionaries it is never used to imply a lapidary, an engraver or a sculptor, those being indicated by the terms *manikāra*, *takshaka* or *Mudrākāra* and *Bhāshkara* respectively.

‡ Verses 1st, 2nd, 4th, 5th, 6th, 9th, 11th, 18th, 23rd, 26th, and 30th, are in the Sārdulavikṛīḍita measure, which reckons 19 syllables to the foot with a cæsure after the 12th, the long and short syllables being arranged thus — — — ∪

∪ — ∪ — ∪ ∪ — — — ∪ — — — ∪ — — —
The 7th, 8th, 10th, 17th, 19th, 20th, 21st, 22nd, 24th, 28th and 29th are in the well known octosyllabic anuṣṭubh.

Five verses, viz. the 13th, 14th, 15th and 27th are in the Vasantatilaka, a measure of 14 syllables to the foot, with a cæsure at the 8th, thus :

— — — ∪ — ∪ — ∪ — ∪ — ∪ — —

The 3rd verse is in the Sragdharā of 21 syllables, with a cæsure at every seventh syllable, thus — — — ∪ — — — ∪ — — — ∪ — — — ∪ — — — ∪ — — — ∪ — — — ∪ — — —
the 12th in the Indravajra of 11 syllables, — — — ∪ — — — ∪ — — — ∪ — — — ∪ — — — ∪ — — —
the 16th in the Rathoddhatā of 11 syllables, thus — ∪ — ∪ — ∪ — ∪ — ∪ — ∪ — ∪ — ∪ —
and the 25th in the measure of the Meghaduta, the mandīkrāntā, thus, — — — — —
∪ ∪ ∪ ∪ — — — ∪ — — — ∪ — — —



PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR MAY, 1863.

The monthly general meeting of the Asiatic Society of Bengal was held on the 6th instant.

E. C. Bayley, Esq., in the chair.

The proceedings of the last meeting were read, and the chairman having put the question that they be confirmed, Mr. Oldham moved that the paragraph commencing, "The motion was opposed" so far as the words "due notice given" be omitted.

The chairman stated that the note quoted in Mr. Grote's amendment had been advisedly omitted from the record of the proceedings, as being explanatory only, but that it could be inserted if the meeting thought it expedient.

Mr. Oldham's motion having been put to the vote, was lost, and the record of the proceedings, with the addition of the note referred to, was then confirmed; Mr. Oldham then handed in a protest on the ground that the record was in his opinion "incorrect, partial, and unfair."

Presentations were received—

1. From the National Hungarian Museum, a collection of fishes, reptiles, birds and mammals.
2. From A. G. Macdonald, Esq., through Mr. J. D. Gordon, a skull and teeth of *Rhinoceros Indicus*.
3. From Lieutenant-Colonel E. T. Dalton, several crania from Ranchee, in Chota-Nagpore.
4. From Baboo Giridharee Lal, some supposed fossils from Raj-mehal.

5. From Colonel Phayre, four inscribed tiles with Buddhist figures, found at Pagan.

6. From the Literary and Philosophical Society of Manchester, several publications of the Society.

7. From the Right Hon'ble the Secretary of State for War, through the Superintendent of the Ordnance Survey, a copy of the Meteorological Observations, taken at the Stations of the Royal Engineers, during 1853-59.

8. From the Under-Secretary, Government of India, Foreign Department, a copy of a report on the Island of Mahi, the largest of the Seychelle group, by Lieutenant-Colonel L. Pelly.

The following correspondence between the Council and a Committee of gentlemen at Lahore who had associated themselves for the furtherance of the objects of the Society, was submitted for the information of the meeting :—

TO THE SECRETARY TO THE ASIATIC SOCIETY OF BENGAL.

Dated Lahore, January, 1863.

SIR,—I have the honor to forward, herewith, copy of the proceedings of a meeting held at Lahore on the 27th instant for the purpose of devising some plan for collecting information concerning the antiquities, ethnology, physical statistics, &c. of the Punjab and adjoining countries.

2. The Committee are anxious to co-operate, if possible, with your Society, and would feel obliged if you would intimate whether their proposal is acceptable, and in the event of its being so, will be thankful for their suggestions and guidance in the matter.

3. The first object of the Committee will be to collect, in a compact shape, all the information upon the above mentioned subjects which already exists scattered through the pages of local reports, magazines, and scientific journals.

4. Their next object will be to collect further information from local officers and other persons taking an interest in these subjects.

5. The Committee believe that, being placed, as they are, at the seat of the local Government, and having access to the Government records, they are favorably situated for carrying out both these objects ; at the same time they would wish it to be clearly understood that they have no intention to trespass upon the field already occupied

by the Asiatic Society of Bengal, but are simply desirous of aiding, by an organized effort, the promotion of the objects of the Society.

I have &c.,

(Sd.) T. H. THORNTON,

Secretary to the Provincial Committee.

“Proceedings of a meeting held on 27th January, 1863, with a view of devising some plan for collecting information regarding the antiquities, ethnology, climatology, arts, manufactures, &c., of the Punjab and adjoining countries.

“Present :—Lieutenant-Colonel Maclagan, Secretary to Government, Department of Public Works ; R. H. Davies, Esq., Secretary to Government ; Dr. Cleghorn, Conservator of Forests, Madras, (on deputation to the Punjab) ; T. H. Thornton, D. C. L., Judge of Small Cause Court, and Curator of the Lahore Museum.

“Unavoidably absent.—T. D. Forsyth, Esq., C. B. ; Commissioner of Lahore Division ; D. F. McLeod, Esq., C. B., First Commissioner, Punjab ; R. N. Cust, Esq., Judicial Commissioner of the Punjab.

“Lieutenant-Colonel Maclagan having consented to preside, and Mr. T. H. Thornton to act as Secretary.

“It was resolved—

1. “That communication be opened with all Commissioners and Deputy Commissioners and Assistants in independent charge, writing to them to co-operate, and also with the following gentlemen :—

Rev. Isidore Loewenthal, (Missionary, Peshawur) ; Rev. H. A. Jaesche (Missionary, Kotgurh,) and Mr. Drew (Kashmir).

2. “That the following gentlemen be asked to be members of the Committee :—R. Stevens, Esq. ; Dr. Brown ; Dr. Neil, and Pundit Munphool.

3. “That Mr. Davies be requested to prepare a memorandum of the existing information regarding the tribes, &c. inhabiting the Punjab and adjoining countries.

4. “That Lieutenant-Colonel Maclagan be requested to prepare a similar memorandum regarding the arts and manufactures.

5. “That Dr. Cleghorn be requested to afford his aid in the same manner, regarding the fauna and flora of the Punjab.

6. “That Mr. T. H. Thornton be requested to prepare from local reports, and other memoranda, a list of objects of historical and

antiquarian interest, concerning which further information is desirable.

7. "That a copy of the proceedings be forwarded to the Secretary of the Asiatic Society of Bengal, with an intimation that it is the desire of this Provincial Committee to co-operate with the Asiatic Society in the manner above indicated, or in any other way by which the objects of the above Society may be promoted, and that they will feel obliged by the Society's guidance in the matter."

FROM THE SECRETARY TO THE ASIATIC SOCIETY OF BENGAL,
To T. H. THORNTON, Esq.,

*Secy. to the Provincial Committee, Lahore,
Asiatic Society's Rooms, Calcutta, 9th March, 1863.*

SIR,—Your letter, dated January 1863, with its enclosures, having been taken into consideration by the Council of the Asiatic Society, I am directed to express the great gratification with which they have received the announcement of the influential movement at Lahore in furtherance of the objects to which the operations of this Society have always been directed. The Council feel that concentrated local efforts, to promote these objects, cannot fail to be of great advantage as well to the Society itself as to the general interests of literature and science, and they believe that such efforts will be especially valuable in the Punjab, where the field of enquiry is of more than ordinary interest, and gives promise of a rich and abundant harvest. They, therefore, desire me to respond most cordially to the offer of co-operation which has been made to them by the Lahore Committee, and to intimate that they are prepared to assist in carrying out the objects proposed to the utmost extent of the means at their disposal.

But before suggesting any definite arrangements for mutual assistance, the Council desire to be informed what are the precise wishes and intentions of your Committee as to its own constitution and the publication of its proceedings and researches; whether it is proposed that the Committee should be constituted as a separate body corresponding with, but independent of, this Society, and publishing its own records, or whether its object is rather to work as a Local Committee of this Society, contributing its papers for publication in the Society's Journal.

The Council would gather from your letter and from the resolutions of the Committee that the latter course is the one contemplat-

ed, but they are unwilling to assume that this is the case without a definite assurance that they have not misinterpreted the Committee's views.

At the same time, I am to say that the Council are generally of opinion that the association at Lahore will be most permanently useful by co-operating as a local Committee with the Society. It has been found that all attempts hitherto made to maintain independent societies in the interior of the country have invariably failed, and the Council believe that the time has not yet arrived when similar attempts are likely to be attended with more than temporary success.

The Council will be glad to be put in possession of your Committee's view on this point, and receive any suggestions that may occur to you regarding the mode in which communication should be conducted, and they will then endeavour to make such arrangements as will meet your wishes and be most conducive to the success of the object of the Committee and this Society.

I have, &c.,

(Sd.) W. S. ATKINSON,

Secretary, Asiatic Society of Bengal.

FROM T. H. THORNTON, ESQ., D. C. L.,

Secretary, Lahore Committee.

TO THE SECRETARY TO THE ASIATIC SOCIETY OF BENGAL.

Dated, Lahore, the 21st April, 1863.

Sir,—Your letter of the 9th March last has been laid before the Lahore Committee, whose meeting was somewhat delayed owing to the absence of some of the principal members from Lahore, and I am directed to reply as follows to the inquiries made regarding the “precise wishes and intentions of the Committee as to its constitution, and the publication of its proceedings and researches.”

2. The latter portion of your second paragraph correctly describes what the desire of the Committee is, viz., to be a Local Committee of the Asiatic Society, contributing its papers for publication in the Society's Journal.

3. They would prefer this to attempting to establish an independent Society, for the reason you mention; for in a Society like that of Lahore, composed chiefly of Government officials and other persons

liable to removal, it is impossible to ensure a continued active interest in the department of literature taken up by the Asiatic Society of Bengal. They are of opinion that as a Local Committee of your Society, as much might be done by them for forwarding the objects they have in contemplation, as if they were an independent body; while on the other hand, the duties being less onerous, the fear of failure is less. They would wish, therefore, to be styled,—should the appellation meet with the approval of your Society—"The Punjab Local Committee of the Asiatic Society of Bengal."

4. Of the present members of the Committee,* the majority are

* PRESIDENT.

Lieut.-Colonel Maclagan.

Members.

D. F. Macleod, Esq., C. B.

R. N. Cust, Esq.

R. H. Davies, Esq.

T. D. Forsyth, Esq., C. B.

R. E. Egerton, Esq.

Dr. Cleghorn.

Dr. B. Brown.

Capt. Stubbs, R. A.

Dr. Neil.

T. H. Thornton, Esq., D.C.L.

C. A. D. Gordon, Esq.

already members of your Society, and I myself, though not a member, am anxious to become one, but I presume that the fact that all the members of the Committee are not members of the Asiatic Society will not be considered an objection to their recognition as a Local Committee of your Society. Should such be the case, perhaps the appellation "Punjab Auxiliary Committee to the Asiatic Society"

would meet with your approval.

5. Having thus described the position the Committee would wish to assume in relation to your Society, I have now the honor to intimate the views of the Committee regarding their future proceedings.

6. Their first object will be to collect together in a compact shape, from scientific journals and local reports, all the existing information regarding the antiquities, ethnology, arts, and physical statistics of this Province.

As regards ethnology, the task has been undertaken by Mr. Davies, Secretary to the Government, but as that gentleman has suddenly left for England on six months' leave, Mr. Cust has kindly taken it off his hands for the present.

The subject of arts has been entrusted to Lieut.-Col. Maclagan; that of flora to Dr. Cleghorn; meteorology to Dr. Neil; numismatics to Capt. Stubbs, and archæology and history to the Secretary.

7. This being done, they propose to issue from time to time lists of *desiderata* to the local officers of the Provinces, and to others interested in these subjects, from whom they have already received

assurances of support; and they have already issued one general circular, a copy of which is annexed, for furnishing periodical lists, such as I have described. Any assistance or suggestions from your Society would be gratefully received.

8. They would further propose that any written contributions of importance which they may receive be forwarded in *extenso* for publication at your Society's discretion, in the Asiatic Society's Journal, and that from time to time a *resumé* of information obtained and of the proceedings of the Committee generally, should be furnished by the Secretary.

9. With regard to any coins or other antiquarian remains of interest which may be contributed, the Committee would reserve a discretion of depositing them in the local Museum of Lahore, if they think fit.

10. I may add that the Punjab Government has evinced a great interest in the Committee, and has intimated its desire to aid its operations in every way it can; and that the Committee hope that, by their own exertions, aided by the countenance and assistance of your Society, they may be able to be of some use in collecting information of value and stimulating further research in a region abounding with objects of historical, ethnological, and physical interest.

I have, &c.,

(Sd.) T. H. THORNTON,

Secy. to the Lahore Committee.

The chairman intimated that further information would be communicated when the correspondence was complete.

The nomination of the Hon'ble H. S. Maine to be a member of the Council, vice the Hon'ble C. J. Erskine was confirmed.

The Council reported that on the recommendation of the Natural History Committee they had raised the salary of Mr. J. Swaries, taxidermist, at the rate of 4 aunas for every working day.

A letter from Rev. T. H. Buru intimating his desire to withdraw from the Society was recorded.

The following gentlemen, duly proposed at the last meeting were balloted for and elected ordinary members:—

Lieutenant H. R. Thuillier; H. D. Robertson, Esq., C. S.; P. W. Wall, Esq.; W. H. Stevens, Esq.; Dr. J. Tyler; Hon'ble E. P. Levinge, and W. Edgar, Esq., B. C. S.

The following gentlemen were named for ballot as ordinary members at the next meeting :—

W. Clementson, Esq., Executive Engineer, Bassein, proposed by Mr. Theobald, and seconded by Mr. Atkinson.

Colonel Hamilton, Commissioner of Delhi, proposed by Mr. Cooper, and seconded by Mr. Grote.

Captain G. C. Depree, Royal Artillery, proposed by Lieutenant-Colonel Dalton and seconded by Mr. Atkinson.

T. D. Forsyth, Esq., C. B., Commissioner of Lahore, proposed by Colonel Maclagan, and seconded by the President.

Baboo Chundersekur Roy, of Julpigorie, proposed by Baboo Rajendra Lal Mitra, and seconded by Mr. Grote.

T. H. Thornton, Esq., C. S., proposed by Mr. Bayley, and seconded by Mr. Grote.

Hon'ble G. Campbell, proposed by Mr. E. C. Bayley and seconded by Mr. Grote.

Mr. Oldham gave notice that he would move at the next meeting—

1. That he would call the attention of the Society to the careless and discreditable manner in which the Journal of the Society is at present conducted, as calculated to reflect very serious disgrace on the Society ; and to the unreasonable delays which occur in the issue of the several numbers, by which much of their contents is rendered obsolete and comparatively useless.

2. That inasmuch as no improvement in the Museum of the Society is visible, the Council be requested to state in detail the steps which have been taken for the proper disposal of the sum of Rs. 200 per mensem granted by the Government for the improvement and support of the Natural History Museum of the Society, which sum the Society has received since April, 1862.

Captain Lees gave notice that at the same meeting he would move—

That Bye-Law 77 of the Society be amended as follows :—

The Council shall elect from their own body Sub-committees or sections of Oriental literature, Natural History, &c., also a Sub-committee of Finance, whose reports on all matters referred to them shall be submitted to the Council.

Communications were received—

1. From the Secretary, Government of India, Public Works De-

partment, a copy of a letter from Major General Cunningham, forwarding his daily report of occupations for February last.

2. From the Under Secretary, Government of India, Public Works Department, a printed copy of a memo. by Major General Cunningham, regarding the life-size statues recently discovered inside the Delhi palace, together with a copy of the report of his occupations in January last.

Mr. Bayley read the memorandum as follows :—

“1. On the information furnished to me by Mr. Cooper, Deputy Commissioner of Delhi, I went to the palace to inspect the fragments of two human statues in red stone, and of two statues of elephants in black stone, which had lately been found in clearing away some old building inside the area of the palace walls.

“2. The two human statues which are of life-size are formed of single blocks of the well-known reddish chocolate-coloured sandstone of Futtehpore Sikri. One of the heads is missing, and the other is separated from the statue, having been broken at the neck. The head-dress is that of a royal personage, such as is seen in the pictures of the kings of Delhi, and such as is now worn by all Rajput princes. But the figure is certainly that of a Hindu, as the dress is represented with its opening over the right breast. Both figures are squatted in the native fashion. They were probably coloured originally to represent the real figures, as the spots of the stone are not visible anywhere on the surface, but only at the points of fracture.

“3. The elephant statues are each formed of many pieces of hard black stone, which were originally built up with thick square bars of wood inside the legs, the pieces being joined together by fine lac. One forefoot measures six feet five inches in girth, and another measures six feet two inches. If the height accorded with the well-known proportion of twice the girth of the forefoot, these statues would have been colossal, or not less than twelve feet; but I believe that the legs of these figures, as is usual in all Indian statues of elephants, were made somewhat stouter than nature, to obtain actual stability, as well as to give an appearance of sufficient strength. The number of pieces of these statues is very great, and many of them are much injured; but I think that one complete statue, or very nearly complete, might be built up with a little care and trouble. I recognised the following pieces :—

“1st.—Top of head to below the eyes, in two pieces, which were joined perpendicularly.

“2nd.—End of the trunk, holding a chain and resting on the ground.

“3rd.—Two ears, each three feet long.

“4th.—Piece of back, towards the tail.

“5th.—Piece of stomach, hinder portion.

“6th.—Several pieces of a howdah. The chains (which no doubt supported bells) are formed of yellow stone let into the black stone of the howdah ; similarly, the cotton ropes which fastened the howdah, are formed of white marble.

“7th.—There are also several pieces with straight-lined ornamentation in white and yellow stone, let into the black stone, which, I presume, must have represented the decorated borders of the *jhal* or cloth trapping, which is usually embroidered in gold and silver.

“8th.—A doubtful piece with a deep round socket. This may, I think, have been part of the jaw for the insertion of a tusk, which would, of course, have been made of white marble.

“4. From this brief account it is evident that, in these broken statues of men and elephants, we possess something quite unique in Indian sculpture. The human figures are of life-size, and although the legs of the elephants are rather massive, I believe that their statues were also of the usual height. Small statues of elephants are not uncommon, and may be seen in many Indian temples ; but with one single exception, I am not aware that the Hindu artists have ever attempted so large a piece of sculpture as a full-size figure of an elephant. The exception which I refer to was the great elephant statue which once stood on a pedestal outside of the upper gate of the fort of Gwalior, which was accordingly called *Hathiya-Paur* or *Elephant Gate*—a name which it still bears, although the statue has long ago disappeared. This statue was of life-size, and bore on its back three human figures—namely, *Raja Man Singh* of Gwalior, with his *mahout*, and his attendant umbrella-bearer. *Raja Man Singh* died during the siege of Gwalior by *Ibrahim Lodi* in A. D. 1518. The group was soon afterwards seen by the Emperor *Babur*, who describes it fully in his memoirs. It is afterwards noticed by *Abul Fazl* in his *Ayin Akbari*, written in the 40th year of *Akbar's* reign, and it is last noticed by an English merchant who visited the fort of Gwalior in

the reign of Shah Jehan. That it was removed during the reign of his son and successor, the bigoted Aurungzebe, I have little doubt, as it is omitted in his minute account of Gwalior by Hiranman, a Hindu Moonshee in the employ of Aurungzebe's Mahomedan governor of the fortress.

"5. Now it seems to me possible that the statues just discovered in Delhi may have been brought from Gwalior, for tradition says that there was formerly a second life-size elephant in the Gujar Mahal, at the foot of the fort of Gwalior. That it was usual to remove such objects to Delhi, we have a proof in the case of the brass statue of a bull which was obtained by Ibrahim Lodi on his capture of the Badilgarh outwork of the fort of Gwalior. This brazen statue, according to Ferishta, was carried to Delhi and thrown down before the Bagdad gate of the city.

"6. I know of only one objection to this identification of the Delhi statues with Man Singh's missing group from Gwalior—namely, the probability that all the statues would have been formed of the durable light-coloured sandstone of Gwalior. But as a black stone was selected for the elephants, it seems probable that the designer may have purposely made use of the reddish brown sandstone of Futtehpoore Sikri for the human figures, for the special purpose of giving the group as nearly as possible the actual colours of real life. This idea is further carried out in the white and yellow marbles of the ropes and chains. It is only a surmise, however, that the Delhi figures may possibly be the very group that once adorned the upper gate of the fortress of Gwalior. Perhaps some one of the three authorities whom I have quoted as making mention of the statue, may have noticed some peculiarity of colour that may settle this point. I have no means of reference at present in camp, and am writing from memory, as I have only a few books with me.

"7.—But whether these Delhi statues be identical with the Gwalior group or not, their value as unique specimens of Indian sculpture is undoubted. I would therefore most earnestly recommend that immediate steps should be taken for their preservation and that an attempt at least should be made to reconstruct one of the elephant statues. If one statue should be found complete, or nearly so, it should, of course, be preserved: but even if the fragments should be found insufficient for one statue, I think that an attempt might still

be made to complete it with the aid of brick and mortar coloured black, if only for the purpose of having the group photographed.

"8.—Perhaps Lieut. Macsween, of the Engineers, would be able to set up one of these statues at a small expense, say of Rs. 50, in about one fortnight.

(Sd.)

"A. CUNNINGHAM, *Major General,*

"Archæological Surveyor to the Govt. of India.

3. From Baboo Gopeenath Sen; Abstract of the Meteorological Observations taken at the Surveyor General's Office, Calcutta, in February last.

4. From Mr. W. Theobald, Jr., the following note on the phenomenon known as Ignis-fatuus, or Will-o'-the wisp:—

"MY DEAR ATKINSON,—I wish through the pages of the Society's Journal to direct the attention of observers interested in the enquiry, to that curious, and, I believe, hitherto unsatisfactorily explained phenomenon "Ignis-fatuus" or "Will-o'-the-wisp," and to record a curious belief current in Burmah respecting it:—I am aware that a certain class of reasoners have ventured to throw doubts on the very existence of the phenomenon in question and have sarcastically suggested that three conditions are requisite to insure its reported development—that the ground must be 'boggy,' the atmosphere 'foggy' and the philosophic observer decidedly 'groggy,' at the time; but having been myself a frequent eye-witness where only the two first conditions were more or less realised, I must dissent from this somewhat less charitable than ingenious theory. The European superstition of the 'Elfish' origin of Ignis-fatuus is well known, and in Hindustan the belief is prevalent that the light is borne by a ghost. The Burmese belief is very curious and recalls some mediæval European superstitions of like character, and if it proves nothing more, the existence in three distinct regions of a different belief, as explanatory of a certain phenomenon, goes far to prove the reality and non-imaginary character of the appearance in question.

"In Burmah it is believed that there is a class of wizards whose heads become dissociated from their bodies during the night and wander about the jungle feeding on carrion, the bodies remaining at home, and the Ignis-fatuus is supposed to proceed from the mouth of one of the wandering heads. If a head is secured whilst abroad it

loudly claims to be released, and if detained more than twelve hours from rejoining its body, both head and body perish, and it is believed that such heads have often been captured, though I need hardly add, none of my informants had themselves seen one. This superstition calls to mind the one formerly current in Europe that the body of a witch might remain at home, or its semblance, whilst the spirit was at its evil practices abroad; hence the inutility of an *alibi* for the wretched beings accused of witchcraft. In India, Ignis-fatuus is commonly known by the name of *Bhutni*. It usually occurs near villages and usually about tanks, or marshy spots, flat malarious country. The phenomenon is very common around the Rajmahal hills, on the flat alluvium near the hills, and the best instance I ever witnessed was near one of the bungalows built by the late M. Pontet near where the railway passes, but the exact name I have forgotten. It was a cold night in January (I think) when, about nine o'clock, I was called by my servant in accordance with previous direction of mine, and told that 'many *Bhutnis*' had come out. Sure enough several lights were visible moving about a little, but usually not far from one spot. I think I must have watched one at some 300 yards for a quarter of an hour, and can only describe it without suggesting an explanation, save that it may have possibly originated with some luminous insects collected together. The light had all the appearance of an ordinary *mussal* or oil torch, and appeared fully as large and as bright. It had the appearance of emanating from some slowly consuming body with the evolution of phosphorescent fumes, but this might be merely the effect of a vivid light on the dense cloudy stratum of fog at that particular spot. The night was still, but an occasional puff of air would alter the position of the light; which, however, seemed to possess the power of independent motion. The light faded or even disappeared under a stronger breeze, to re-appear on its dying away. The spot where this light I am describing centered was near a tank in some flat ground traversed by a small sluggish stream, and a tank margin is a common spot for such lights to be seen on. I can add little more regarding the mysterious appearance, save my conviction that its origin has yet to be traced out and established; my own belief in favor of a congregation of luminous insects being hesitatingly adopted for want of a better, and from the fact, as I take it, of the light shifting its position indepen-

dently of the wind, whose stronger force only causes its temporary extinction.

“Your’s sincerely,

“ (Sd.) W. THEOBALD, *Junior*.

Bassein, 1st April, 1863.”

“N. B.—I have forgotten perhaps the most important observation I made with respect to this light—viz., that it is decidedly fluctuating like that of a revolving light of a lighthouse. After a certain period of ordinary brightness the light increases in size and brightness and rapidly attains its maximum effect, after which it slowly fades, sometimes to a mere speck barely visible, or even disappears for a minute or two.”

5. From Lieutenant-Colonel Phayre, a paper on the history of the Burman race.

6. From the same, a memorandum on some ancient tiles obtained at Pagan, in Burmah.

7. From Major General Cunningham, a paper entitled “Remarks on the Bactro-Pali inscription from Taxila.

Mr. Bayley prefaced the reading of Major General Cunningham’s paper by the remark that he had transmitted some time before to Mr. E. Thomas, in England, a tentative translation of the greater portion of the inscription, the general purport of which agreed with that now given by Major General Cunningham, save on one or two important points—viz., the supposed name of the king and of the month, also as to the name of the Satrap’s son, but that he would reserve fuller remarks until the receipt of Professor Dowson’s paper.

Major General Cunningham’s communication having been read, Baboo Rajendralal Mitra said that since the publication of the last number of the Journal he had devoted some attention to the Taxila inscription and prepared a translation of it, which though generally similar, was, as regards the interpretation of several words, different from the version submitted to the meeting by Major General Cunningham. He pointed out those differences in detail and advanced some reasons which led him to think the General’s determination of the name of a Greek month upon the relic, open to question. The original paper and the Baboo’s comment on it will appear in an early issue of the Journal.

Mr. Bayley agreed with Baboo Rajendralal Mitra that the name

of the month was not that of a Greek month in the present instance, and believed further that the era used was that of the Great King Kanishka, which he believed to be probably identical with that of Vikramaditya.

The Chairman announced that Mr. Waterhouse, Royal Artillery, had brought to the meeting a fine series of photographs of the Bhilsa Topes, copies of which he offered to present to the Society.

The offer was accepted and the thanks of the meeting were voted to Mr. Waterhouse.

The Librarian then submitted the usual report.

LIBRARY.

The following additions have been made to the Library since the last meeting.

Presented.

Memoirs of the Literary and Philosophical Society of Manchester. Vol. IV. Part 2, and Vol. V. Parts 1 and 2, Second Series—Vols. III. to XV. and Vol. I. Third Series—BY THE SOCIETY.

A New System of Chemical Philosophy by John Dalton, F. R. S., Vol. I. Part 1, and Vol. II. Part 1.—BY THE SAME.

Meteorological Observations and Essays by John Dalton, D. C. L., F. R. S.—BY THE SAME.

Proceedings of the Literary and Philosophical Society of Manchester, Vol. II. Sessions 1860-61 and 1861-62.—BY THE SAME.

Bye-Laws and Regulations of the L. and P. Society of Manchester.—BY THE SAME.

The Annals of Indian Administration, Part 1, of Vol. VII.—BY THE BENGAL GOVERNMENT.

Annaler for Nordisk Oldkyndighed for 1859.—BY THE COPENHAGEN SOCIETY.

Mémoires de la Société Royale des Antiquaires du Nord, 1850-60.—BY THE SAME.

Inscriptions Runiques der Slesvig Méridional, interprétees par C. C. Rafn.—BY THE SAME.

Abhandlungen der Akad. d. Wissenschaften Zu Berlin for 1861.—BY THE BERLIN ACADEMY.

Abstracts from the Meteorological Observations taken at the stations of the Royal Engineers in the years 1853-4, 1854-5, 1855-6,

1856-7, 1857-8, and 1858-9, edited by Col. Sir Henry James, R. E., F. R. S., &c.—BY THE SECRETARY OF STATE FOR WAR.

Archiv für Kunde Österreichischer Geschichts-Quellen, Vol. XXVII. Part 1.—BY THE SOCIETY.

Appendix No. 5, with a map of the Nizam's dominions.—BY THE BENGAL GOVERNMENT.

Almanach der Kaiserlichen Akademie der Wissenschaften, Zwölfter Jahrgang, for 1862.—BY THE VIENNA ACADEMY.

Atlas Van Over Nievo Guinea.—BY THE NETHERLAND SOCIETY.

Bijdragen tot de Taal,—Land. en Volkenkunde Van Nederlandsch Indië—Vijfde deel.—BY THE SAME.

Bulletin de l'Academie Imperiale des Sciences de St. Petersburg, Vol IV. Nos. 3-6.—BY THE IMPERIAL ACADEMY.

The Charter, Bye-Laws and Regulations of the Zoological Society of London, incorporated March 27, 1829.—BY THE SOCIETY.

The Calcutta Christian Observer for April.—BY THE EDITORS.

Remarks on the Topography and Diseases of the Gold Coast. By R. Clarke, Esq. (Read before the Epidemiological Society, May 7th 1860).—BY THE AUTHOR.

Grammatices Palicae by G. S. Guestphalus.—BY DR. WEBER.

Finale as in Sanskrit vor Tönenden; from p. 385 to 404. By Dr. Weber.—BY THE AUTHOR.

Die Fossilen Mollusken Band II. Parts 3 and 4, by Dr. Hornes.—BY THE VIENNA MUSEUM.

Considerations on the Phenomena attending the fall of Meteorites on the Earth. By W. Haidinger (From the Philosophical Magazine for Nov. and Dec. 1861).—BY THE AUTHOR.

Journal of the Statistical Society of London Vol. XXVI. Part 1.—BY THE SOCIETY.

Journal of the Chemical Society of London, Nos. 5 and 6, of 1862.—BY THE SOCIETY.

Lexicon Geographicum—Decimus Fasciculus. By T. G. J. Junynboll.—BY THE LUGD. BATAVIAN ACADEMY.

Journal of the Proceedings of the Linnean Society—Zoology, Vol. VI. Nos. 21 to 23, and Botany, Vol. VI. Nos. 21 to 23.—BY THE SOCIETY.

Jahrbuch—Vol. XII. No. 2.—BY THE VIENNA MUSEUM.

Kaladlit Assilialiale or Woodcuts drawn and engraved by Greenlanders.—BY THE COPENHAGEN SOCIETY.

Indische Alterthumskunde by C. Lassen.—BY THE AUTHOR.

Land Anecdota Syriaca, Vol. I.

List of Vertebrated animals living in the gardens of the Zoological Society of London, 1862.—BY THE SOCIETY.

List of the Linnean Society of London, 1861.—BY THE SOCIETY.

List of the Royal Society of London, 20th Nov. 1861.—BY THE SOCIETY.

Contents of the Correspondence of Scientific men of the 17th century. Compiled by Augustus De Morgan, F. R. A. and C. P. S. 1862. Pamphlet.—BY THE COMPILER.

Memoires de l'academie Imperiale des Sciences de St. Petersburg, Vol. IV. Nos. 1 to 9.—BY THE IMPERIAL ACADEMY.

Notices of the Proceedings at the meeting of the members of the Royal Institution of Great Britain for 1861-62.—BY THE INSTITUTION.

The Oriental Baptist for March.—BY THE EDITOR.

Oriental Christian Spectator for Jan. and Feb.—BY THE EDITOR.

Proceedings of the Royal Geographical Society of London, Vol. VII. No. 1.—BY THE SOCIETY.

Proceedings of the Royal Society of London, Vol. XII. No. 53.—BY THE SOCIETY.

Photographs of Views in Kashmir.—BY CAPT. MONTGOMERIE.

Photographs illustrating the hill tribes on the Peshawur Frontier.—BY CAPT. MELVILLE.

Proceedings of the Royal Society of Edinburgh, Vol. IV. No. 56.—BY THE SOCIETY.

The Proceedings of the scientific meetings of the Zoological Society of London, Part 3, of 1861 and Parts 1 and 2, of 1862.—BY THE SOCIETY.

The Quarterly Journal of the Geological Society, Vol. XIX. No. 73.—BY THE SOCIETY.

Annual Report on the Administration of the Province of Oudh, for 1861-2.—BY THE BENGAL GOVERNMENT.

Annual Report of the Branch of the Marine Department under the control of the Government of India for 1861-2.—BY THE SAME.

Report of the Committee of the Bengal Chamber of Commerce from 1st May to 31st Oct. 1862.—BY THE CHAMBER.

Streiter's *De Sunahsepo Fabula Indica ex codicibus manuscriptis edita*.—BY THE AUTHOR.

Schoenborn's *Aitareya Brahmanae Specimen*.—BY THE EDITOR.

Selections from the Records of the Madras Government, Nos. 72 and 74.—BY THE BENGAL GOVERNMENT.

Sitzungsberichte der Kaiserlichen Academie der Wissenschaften, Philos.—Histoire Classe, Vol. XXXVIII. Part 3, and Vol. XXXIX. Part 1; Mathematische Classe, Vol. XLV. Part 1, Heft 1 and 2, Part 2, Heft 1, 2, 3 and 4.—BY THE ACADEMY.

Table of high and low water at the Kidderpore docks, for 1863.—BY MR. J. OBBARD.

Transactions of the Royal Irish Academy, Vol XXIV. Part 2.—BY THE ACADEMY.

Transactions of the Government of India in the Financial Department in 1861-62.—BY THE BENGAL GOVERNMENT.

Transactions of the Linnean Society of London, Vol. XXIII. Part 2.—BY THE SOCIETY.

Transactions of the Royal Society of Edinburgh, Vol. XXIII. Part 1.—BY THE SOCIETY.

Transactions of the Zoological Society of London, Vol. IV. Part 7, and Vol. V. Part 1.—BY THE SOCIETY.

Weber's *Indische Studien*, Vol. V. Parts 2 and 3.—BY THE EDITOR.

Journal Asiatique, Vol. XX. No. 79.—BY THE SOCIÉTÉ ASIATIQUE DE PARIS.

Exchanged.

The Athenæum for January and February.

The London and Edinburgh Philosophical Magazine, Vol. XXIV. Nos. 166 and 167.

Purchased.

Gould's *Birds of Asia*, Parts 1 to 14.

Dabry's *La Médecine chez Les Chinois*. By M. J. Léon Soubeiran.

Numismatic Chronicle and Journal of the Numismatic Society of London, *New series*, No. 8.

The Parthenon, Vol. II. Nos. 38 to 46.

The American Journal of Science and Arts, Vol. XXXV. No. 103.

Conchologia Iconica, by Lovell Reeve, Parts 222 to 225.

Annales des Sciences Naturelles, Zoologie, Vol. XIX. No. 1.

Revue et Magasin de Zoologie, No. 12 of 1862, and No. 1 of 1863.

Revue des Deux Mondes for 15th January, February and 1st March.

The Annals and Magazine of Natural History, Vol. XI. Nos. 62 and 63.

Wolf's Zoological Sketches, *Second series*, Parts 3 and 4.

Comptes Rendus, Vol. LVI. Nos. 2 to 7.

Journal des Savants for Dec. Jan. and Feb.

Zenker's Bibliotheca Orientalis, Part 3.

Sir Charles Lyell on the Antiquity of Man.

LALGOPAL DUTT.

6th May, 1863.

FOR JUNE, 1863.

The Monthly General Meeting of the Asiatic Society of Bengal was held on the 3rd Instant.

A. Grote, Esq., in the chair.

Mr. H. F. Blanford, at the Chairman's request, read the proceedings of the last meeting, which were confirmed.

Presentations were received—

1. From Professor T. Goldstücker, a copy of his *Mánava Kalpa Sutrás*, and its preface entitled *Pánini*, and parts 1 to 4 of his *Sanscrit Dictionary*.

2. From Mr. Oldham, on the part of Lieutenant-Colonel J. C. Haughton, a small collection of flint implements from the Andamans.

The following letter accompanied the box, which had been overlooked in the office of the Geological Survey, in consequence of its having been enclosed in another box, alleged to contain shells only, and addressed to the Museum of Economic Geology :—

Port Blair, 29th November, 1861.

MY DEAR SIR,—I send you for submission to the next meeting a collection of what I take to be Andamanese arrow-tips; with them is an English flint arrow-tip (No. 1) for comparison. All the specimens but No. 2 were found on the site of an old Andamanese encampment close to the spot where Blair had his garden in 1789-90. I also found a single iron arrow-head about the size and shape of the ace of

spades in playing cards. It has unfortunately been mislaid. The specimen No. 2, found this morning on the top of Ross Island, where no flint has yet been found, appears either very much weathered or to be altered by fire. All the Andamanese arrows seen during the last two years were either tipped with longish spikes, consisting of nails, convicts' anklets, beaten-out pieces of saws, stolen from us, or they have had a long point of hard wood. I do not remember to have seen any mention of flint implements among the Andamanese before; we must conclude, therefore, that if the specimens now sent were really used for the purpose I suppose, then they belong to an age when iron derived from the wrecks of ships was not to be had around these Islands.

Your's truly,
(Sd.) J. C. HAUGHTON.

To the Secretary, Asiatic Society.

3. From Mr. A. Grote, on the part of Colonel Tytler, a Python from the Nicobar Islands. believed to be a new species, and two species of Herodias from Port Blair, also believed to be different from the Bengal species.

4. From Lieutenant-Colonel James, skin and skeleton of a *Khatass* (*Viverra Zibetha*).

5. From Baboo Rajendra Mallika, skin and skeleton of a Snow Bear.

6. From Mr. H. F. Blanford, an extra copy of his paper on the "Specific Identity of the Described Forms of Tanalia," published in the 23rd Vol. of the Transactions of the Linnean Society of London.

7. From the Madras Central Museum, a collection of Natural History specimens chiefly consisting of fish.

8. From Baboo Prankissen Shaw, skin and skeleton of a *Paradoxurus Musanga*.

The following letter from Lieutenant-Colonel S. R. Tickell, announcing the dispatch of two stone shot, and enclosing list of the kings of Arakan, was read.

Akyab, May 14th, 1863.

MY DEAR GROTE,—Will you kindly present to the Society the accompanying two stone round shot. They were dug up out of the ramparts of the Old Fort of Arakan, by Captain Hamilton, our

Superintendent of Police, at whose request I forward them and beg you will kindly mention him as the donor.

Accompanying is a list of Kings who reigned in Arakan, holding their courts in the city and fort of that name. The city was called the "Old City" (Myohoung) or "Myouko," (the Yam) indifferently. The meaning of the latter name I cannot discover. It was commenced in 1430 A. D., by Khyaw-moon, but not completed till 1531, by Mengba, who armed the fort and established in the ramparts the magazines, which have now been dug into.

The shot are made, you will observe, very symmetrically. It is possible they may have been purchased, with "pierriers," or stone mortars, as they were called, from old Portuguese or other European voyagers. Of guns not a trace has yet been met with in or near the fort, and it is probable they were carried away by the Burmese invaders subsequent to the last Arakan king Sanay, in 1652.

Believe me, &c.,

(Sd.) S. R. TICKELL.

A. D.

Saumoon	1430	commenced city.
Aleykheng	1434	
Kullama Saya	1459	
Dau Shya	1482	
Meng Nyo	1492	
Yansung	1492	
Salengathoo	1493	
Meng Sau ..	1500	
Kasabuddee	1522	
Theereethoo	1524	
Thazata	1525	
Mengba	1531	finished the city.
Meng Tikkha	1553	
„ Sanhla ..	1555	
„ Rikya	1562	
„ Paloung	1584	
„ Raza ..	1603	
„ Khamoung	1626	
„ Theereethoo	1636	
„ Sanay	1652	

A letter from Mr. J. J. Gray, intimating his desire to withdraw from the Society, was recorded.

The following gentlemen, duly proposed at the last meeting, were balloted for and elected ordinary members:—

W. Clementson, Esq.; Colonel G. W. Hamilton; Captain G. C. Depree; T. D. Forsyth, Esq., c. b.; Baboo Chunder Sekur Roy; T. H. Thornton, Esq., c. s.; Hon'ble G. Campbell.

The following gentlemen were named for ballot as ordinary members at the next meeting:—

H. S. Kane, Esq., m. d., proposed by Mr. H. B. Medlicott, and seconded by Mr. H. F. Blanford.

H. L. Porter, Esq., c. s., proposed by Mr. Grote, and seconded by Mr. Blanford.

C. Horne, Esq., c. s., proposed by Mr. Atkinson, and seconded by Mr. Bayley.

The Council proposed Richard H. Barnes, Esq., of Gangarowa, Ceylon, as a Corresponding member.

The Council reported that they had adopted the recommendation made by the Philological Committee in the following report on the subject of the MSS. of the late Sir Henry Elliot:—

Report of the Philological Committee.

The Committee have had under consideration a proposition which has for its object an endeavour to secure the publication, even in an imperfect form, of the valuable materials which the late Sir Henry Elliot had collected for his work on the Mohammedan Historians.

It was the wish of many members of our Society, eight years ago, to offer the Society's aid to Lady Elliot in carrying out the author's project, but no proposition was made, because it was hoped and understood that the more powerful assistance of the Home Government would be given to that end.

The Committee are aware that the late Board of Control, in their letter, dated 4th August 1856, to Professor Wilson, and Messrs. Morley and Bayley, sanctioned the printing of the three first vols. of the Elliot MSS. which had been left ready for press, on the understanding "that the payment by the Court in respect of the three vols. is to be strictly limited to the sum of £500, including the remuneration to the gentleman who may undertake the superintendence of the publica-

tion." It was hoped that the publication of the further vols. might be effected by means of private efforts.

Messrs. Austin's estimate for publishing these three vols. which included a reprint of the 1st vol. altered by the author (500 pp. per vol.) including Oriental type, corrections, and cloth-binding, was £200.

Mr. Bayley, who had examined all the materials, reported on them thus ;—Vols. 4 and 5 far advanced ; 6 and 7, materials and outlines only ready ; 8, nearly as far advanced as vols. 10 and 11, which are about, say, half ready ; 9, in an equally forward state with the three first vols.

The arrangement which was made with Mr. Morley for publishing the work to the extent of the Board of Control's grant was terminated by that gentleman's death, and no similar arrangement has since been found feasible. It seems to the Committee that there is great risk of the late Sir H. Elliot's labours being altogether lost, unless the Society comes forward with an offer to undertake the superintendence of the publication.

They think that an arrangement on some such plan as the following might be made with Lady Elliot in whose possession the materials are.

1.—The publication to be a special series under the title of the "Elliot Papers," or "Remains," under the superintendence of the Philological Committee, as the *Bibliotheca Indica* is published.

2.—This Committee to undertake the carrying each vol., as it stands, through the press. No editorial amendments or alterations to be made.

3.—The charges to be defrayed from the late Court's grant to such extent as this can be made to go. If the Society fail to get this special grant increased they might, with the necessary permission, continue the publication at the charge of the Oriental Fund. Vol. 12 will not be required. It was to contain selected texts, but the Society is already publishing its own selection of these texts in the new series of the *Bibliotheca Indica*.

None of the vols. from 4 to 11, apparently will be full vols. It seems probable that on Mr. Austin's estimate for the cost of three full volumes, the Society will be able to print the whole for from £800 to £900.

4.—The materials to be placed at the Committee's disposal by Lady Elliot. With Mr. E. Thomas' co-operation in England, the Committee will be in a condition to determine what they will require to be sent out and what portion may be left with him, or accessible to him, for compliance with references made to him from this Committee.

5.—Proceeds of the publication to be credited to the Oriental Fund till such time as it shall have been reimbursed for all charges.

The Committee forbear at present to go further into details. The proper time for these will be after obtaining the sanction of the Council and of a general meeting to their communicating with Lady Elliot with a view to entering on an undertaking such as that which is outlined above. They are prepared for great difficulties, but the alternative of facing these is, they fear, to lose the benefit of the researches of one of their most distinguished members.

(Sd.) A. GROTE.
E. C. BAYLEY.
W. N. LEES, Capt.
RAJENDRALAL MITRA.
E. B. COWELL.
W. S. ATKINSON.

30th April, 1863.

After the report had been read the Chairman, in a few words, urged its adoption on the meeting, and some additional explanations of the state in which he had left the materials were given by Mr. E. C. Bayley.

The report was unanimously adopted.

The Chairman observed that he had received a communication from Captain Lees, stating that he was prevented by indisposition from attending the meeting, and requesting that he might be allowed to defer the motion of which he had given notice.

He further observed that in Mr. Oldham's absence the two motions of which he had given notice must also be necessarily postponed. As the notice of these motions had been published in the last meeting's proceedings, he was anxious to explain to the meeting that the Council generally disapproved of both. They did not consider that the management of the Journal was open to the reflections implied in the first, and they were satisfied that the Government grants had been duly appropriated to the service of the Museum. It seemed

expedient to state thus much in anticipation of the discussion that would probably follow on Mr. Oldham's return to Calcutta, when the motions would, he presumed, be duly brought forward.

Communications were received—

1.—From Mr. H. F. Blanford, a note on a tank section at Sealdah.

Mr. Blanford read his paper, and a vote of thanks was passed to him.

2.—From Mr. E. B. Cowell, a paper on the Persian game Chaugán or Hockey on Horseback.

Mr. Cowell read his paper and the thanks of the meeting were accorded to him.

3.—From Captain H. G. Raverty, an account of Upper Kashkar and Chitral, or Lower Kashkar, together with the independent Afghan State of Punj-Korah, including Talash, being a continuation to his "Notes on Kafiristan."

4.—From Capt. H. H. G. Austen, notes on the system employed in outlining the figures of Deities, and other religious drawings, as practised in Ladakh, Zanskar, &c.

5.—From Baboo Gopinath Sen, Abstract of the Meteorological Observations taken at the Surveyor General's Office, in March last.

The Librarian submitted the usual monthly report.

LIBRARY.

The following accessions have been made to the Library since the Meeting in May last.

Presented.

On the specific identity of the described forms of *Tanalia*, by Mr. H. F. Blanford.—BY THE AUTHOR.

The Calcutta Christian Observer for May.—BY THE EDITORS.

Report on Epidemic remittent and intermittent fever occurring in parts of Burdwan and Nuddea Divisions, by Dr. J. Elliott.—BY THE BENGAL GOVERNMENT.

Dictionary, Sanskrit and English, Vol. I. Parts 1 to 4.—BY PROFESSOR T. GOLDSTUCKER.

Mánava Kalpa Sutrás.—BY THE SAME.

Panini, his place in Sanskrit Literature.—BY THE SAME.

Memoirs of the Geological Survey of India, Palæontologia Indica, Part 5.—BY THE MUSEUM OF ECONOMIC GEOLOGY.

Ditto Ditto.—BY THE GOVERNMENT OF INDIA.

The Oriental Baptist for April.—BY THE EDITOR.

Report on the result of the Administration of the Salt Department for 1861-62.—BY THE BENGAL GOVERNMENT.

Selections from the Records of the Bombay Government, No. 68.—BY THE BOMBAY GOVERNMENT.

Selections from the Records of the Bengal Government, No. 39.—BY THE BENGAL GOVERNMENT.

Transactions of the Bombay Geographical Society, Vol. XVI.—BY THE SOCIETY.

LALGOPAL DUTT.

3rd June, 1863.

FOR JULY 1863.

The Monthly General Meeting of the Asiatic Society of Bengal was held on the 1st instant.

A. Grote, Esq., in the chair.

The proceedings of the last meeting were read and confirmed.

Presentations were received—

1. From Major J. L. Sherwill—Specimens of locusts from a flight which passed over Raneegunge on the 1st June.

2. From E. Lockwood, Esq. C. S.,—A large collection of birds' eggs.

3. From Captain E. Smyth,—Skins of birds and animals from Thibet.

4. From Dr. C. Williams.—A collection of bird skins from Burmah.

5. From Major J. T. Walker, Superintendent, Great Trigonometrical Survey,—2 copies of Tables of heights in Sind, the Punjab, N. W. Provinces and Central India.

6. From the Director of the Hydrographischen Anstalt der K. K. Marine, Trieste,—A copy of the first part of "Reise der Oesterreichischen Fregatte Novara um die Erde" with seven lithographed maps.

7. From Mr. A. Grote on the part of Lieutenant Colonel R. C. Tytler,—A second Python from the Nicobar Islands.

8. From Captain H. Howe,—A Somáli wooden pillow and spoons.

9. From J. F. Shekleton, Esq., M.D., Officiating Assay Master,—A copy of the Assay Tables, in continuation of Tables VIII. and IX. of Mr. James Prinsep.

A letter from Mr. D. Fitzpatrick, intimating his desire to withdraw from the Society, was recorded.

The following gentlemen, duly proposed at the last meeting, were balloted for and elected ordinary members:—H. S. Kane, Esq., M.D.; G. E. Porter, Esq., C. S.; C. Horne, Esq., C. S.

R. H. Barnes, Esq., of Ceylon was also balloted for and elected a Corresponding member.

The following gentlemen were named for ballot as ordinary members at the next meeting:—

Coomar Chunder Nath Roy of Nattore, proposed by Mr. H. C. Sutherland and seconded by Mr. Cowell.

Baboo Bunkim Chunder Chatterjea, B. A., proposed by Baboo Gour Doss Bysack and seconded by Mr. Atkinson.

The Council reported that they had adopted the following report of the Philological Committee.

REPORT OF THE PHILOLOGICAL COMMITTEE.

The Philological Committee submit the following suggestion to the Council :

In 1854 Dr. Sprenger published the first Vol. of a catalogue of Persian MSS. at the expence of the government ; similarly in 1855 Dr. Ballantyne published the first Vol. of the great Sanscrit grammar, the *Mahābhāshya* with native commentaries ; and in 1860 Dr. Hall published his *Contribution to an Index of the Hindu Philosophical Systems*. These three works possess respectively great value to European scholars, but unfortunately they are almost entirely unknown even by name in Europe. The Secretary has made enquiries of the Curator of Government Books at Allahabad, and he has learned that the stock of the two latter works is at Allahabad, but we fear that the first mentioned work on Persian Literature was probably destroyed during the mutiny.

As the Government so liberally advanced the expence for the printing of these books, it can hardly have been their intention that the volumes when printed, should remain locked up from the learned world who alone could appreciate them. Now if fifty or eighty copies were ordered for distribution among the principal learned socie-

ties and the leading Orientalists of Europe, Oriental science would be benefited, and the original object of government in printing the books forwarded.

A large portion of the edition of the Rigveda, commenced by the late Court of Directors, and continued by Her Majesty's Government, has been gratuitously distributed in this manner.

The Philological Committee would therefore suggest that a proposition should be made to Government for the distribution of fifty or eighty copies, and the Society might offer to send the books to their respective destinations along with its own publications, government paying any extra expence.

The report was adopted.

Communications were received.

1. From Dr. C. Williams, extracts from a journal of his trip from Mandalay to Bhamoo, containing some accounts of a visit to old Pagan.

The paper was read by the Secretary.

After its perusal the chairman observed that he was in hopes of receiving further communications shortly from Dr. Williams through Colonel Phayre. The Doctor had reported the Bhamoo river to be navigable for steamers up to Bhamoo. He had not found it practicable, in consequence of the disturbances in Yunan, to reach the Chinese frontier, but he had travelled in that direction as far as the Kakhyan mountains.

2. From the Under-Secretary to the Government of Bengal, copy of a journal kept by Mr. J. W. Masters, late Assistant Commissioner at Golaghat, during a tour made by him towards the end of last year in Upper Assam.

3. From Baboo Gopinauth Sen an abstract of the hourly meteorological observations taken at the Surveyor General's Office in April last.

The chairman then addressed the meeting, calling its attention to the intelligence which had just reached India of the successful issue of Captains Speke and Grant's expedition, in Eastern Africa.

Some of the members present, he observed, might probably have known these officers who were both placed by the Home Government at the disposal of the Royal Geographical Society on the 24th February 1860. Captain Speke he had had the pleasure of seeing here when

he came down some 10 years ago to proceed to join Burton's expedition to the Somali country ; though never a member of this Society, he had contributed to the museum a fine collection of zoological specimens made by him under great difficulties in the course of that expedition, and he was a frequent correspondent of the Society's Curator, Mr. Blyth. In later years his efforts in aid of African exploration had been made known through European journals, and they obtained for him in 1861 the gold medal of the Royal Geographical Society.

His first experiences as a traveller were gained in sporting tours in the Western Himalaya, where, as the Society were aware, there was at present another equally enterprising man, long known as a sportsman on and beyond the passes into Thibet, who was only waiting for a mission such as the London Geographical Society entrusted to Captains Speke and Grant, to emulate those officers in their exertions and to achieve, it might be hoped, the same brilliant success. He trusted that now that there was no longer room for doubt as to the sources of the White Nile, we might be able to draw more attention to the doubts that still hang over the sources of the Berhampootur, the solution of which Captain Smyth, with a trusty few, was ready and eager to attempt.

Feeling confident that amid the applause which awaited the travellers in England, a greeting from their old friends in India and from this Society, would be most acceptable to them, he would move a resolution in the following form for the adoption of the meeting :

That this meeting desire to record the high gratification with which they have heard of the successful issue of Captains Speke and Grant's expedition in Eastern Africa, and to offer to those officers their warm congratulations on the great discoveries which have resulted from it.

The Resolution was unanimously adopted.

Captain Lees then brought forward a motion for amending Rule 77 of the Bye-Laws, the notice of which was given at the May meeting.

He stated in a few words his reasons for proposing an alteration in the rule. His object was to prevent the recurrence of discussions regarding the present mode of conducting the Society's journal, which had lately occupied, he thought, too much of their time at more than one of their meetings. He wished to see the Rule amended as follows :

The Council shall elect from their own body Sub-committees or

sections of Oriental Literature, Natural History, &c., also a Subcommittee of Finance, whose reports on all matters referred to them shall be submitted to the Council.

The chairman then read the Rule as it now stands, and moved that Captain Lees' proposed amendment be referred to the Council for report in accordance with Rule 43 of the Bye-Laws.

Agreed to.

The Librarian submitted the usual monthly report.

LIBRARY.

The additions made to the Library since the meeting held in June last are as follows :—

Presented.

Accidents on Railways in India during the year 1861.—BY THE BENGAL GOVERNMENT.

Annual Report on the administration of the Bombay Presidency for 1861-62.—BY THE BOMBAY GOVERNMENT.

The Prayer Book in the Burmese language.—BY THE TRANSLATOR.

The Calcutta Christian Observer for June.—BY THE EDITORS.

Catalogue de Livres Anciens et Modernes, Part 4.—BY THE COM-
PILEE.

Lecture on Buddhism, By G. M. Tagore.—BY THE AUTHOR.

Dictionary Sanskrit and English, Vol. I. Part 5.—BY PROFESSOR
T. GOLDSTUCKER.

Journal of the Chemical Society, 2nd series, Vol. I. Nos. 1 to 3.—
BY THE SOCIETY.

Journal of Sacred Literature and Biblical record, Vol. III. No. 5.
—BY THE EDITORS.

Mittheilungen der Hydrographischen anstalt der, K. K. Marine,
Trieste, Band I. Heft 1, with seven maps.—BY THE ACADEMY.

Memoirs of the Geological Survey of India, Palæontologia Indica,
Part 5.—BY THE BENGAL GOVERNMENT.

Proceedings of the Royal Society of London, Vol. XII. Part 54.—
BY THE SOCIETY.

Report of the Committee of the Bengal Chamber of Commerce,
from 1st Nov. 1862 to 30th April 1863.—BY THE CHAMBER.

Report on the administration of the N. W. Provinces for 1861-62.
—BY THE GOVERNMENT N. W. PROVINCES.

Weekly Statement of Meteorological Returns of the N. W. Provinces from June 1861 to May 1862.—BY THE SAME.

Treaties, Engagements, Sunnuds, &c., Vol. II.—BY THE GOVERNMENT OF INDIA.

Tables of Heights in Sind, the Punjab, the N. W. Provinces and Central India, published under the superintendence of the Trigonometrical Survey of India, 2 copies. By the Superintendent G. T. Survey of India.

Journal Asiatique Sixième Serie, Vol. I. No. 1.—BY THE SOCIÉTÉ ASIATIQUE DE PARIS.

Exchanged.

The Athenæum for March, 1863.

The London and Edinburgh Philosophical Magazine and Journal of Science, Vol. XXV. No. 168.

Purchased.

Bopp's Sanskrita Sprache, Part 2.

The Edinburgh Review for April, No. 240.

Hewitson's Exotic Butterflies, Part 46.

Notices et Extraits des Manuscrits de la Bibliothèque Impériale, Paris, Vol. XIX. Part 1.

Numismatic Chronicle and Journal of the Numismatic Society of London, New Series, No. 9.

The Parthenon, Vol. II. Nos. 47 to 50.

Reinaud's Catalogue Annuaire Française, Vol. V.

Revue et Magasin de Zoologie, No. 2 of 1863.

Revue des Deux Mondes for 15th March 1863.

Annals and Magazine of Natural History, Vol. II. No. 64.

The Westminster Review for April 1863.

Dr. Weber's Indische Studien, Vo. VII. Part 3.

Comptes Rendus, Vol. LVI. Nos. 8 to 11.

Journal des Savants for March 1863.

The Natural History Review for April 1863.

LALGOPAL DUTT.

1st July, 1863.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of April, 1863.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Feet.

Height of the Cistern of the Standard Barometer above the Sea-level, 18.11.

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	29.743	29.817	29.661	0.156	85.0	94.6	78.6	16.0
2	.711	.792	.611	.181	83.8	93.8	76.8	17.0
3	.648	.720	.539	.181	84.7	94.6	75.6	19.0
4	.588	.651	.506	.145	86.0	95.2	77.2	18.0
5	Sunday.							
6	.595	.673	.507	.166	87.3	99.8	79.4	20.4
7	.578	.645	.506	.139	87.1	97.2	81.0	16.2
8	.688	.776	.604	.172	83.1	92.6	69.8	22.8
9	.767	.832	.714	.118	84.0	92.8	75.8	17.0
10	.776	.842	.715	.127	85.0	91.8	79.4	12.4
11	.731	.793	.630	.163	84.5	92.8	77.6	15.2
12	Sunday.							
13	.683	.751	.608	.143	83.4	92.0	74.4	17.6
14	.728	.800	.649	.151	84.5	91.2	79.4	11.8
15	.760	.837	.667	.170	84.7	93.0	74.6	18.4
16	.731	.802	.662	.140	80.8	90.4	72.8	17.6
17	.698	.770	.613	.157	83.5	93.0	76.8	16.2
18	.724	.800	.665	.135	84.0	92.8	77.2	15.6
19	Sunday.							
20	.741	.821	.684	.137	82.7	92.7	74.2	18.5
21	.773	.849	.701	.148	84.8	95.0	76.4	18.6
22	.759	.830	.694	.136	85.2	94.8	78.4	16.4
23	.755	.823	.681	.142	85.3	94.8	78.2	16.6
24	.721	.793	.640	.153	85.9	94.8	79.8	15.0
25	.702	.786	.593	.193	83.1	90.4	75.0	15.4
26	Sunday.							
27	.716	.788	.634	.154	84.5	95.6	75.2	20.4
28	.686	.766	.570	.196	86.5	95.2	77.8	17.4
29	.654	.733	.523	.210	84.2	94.5	76.0	18.5
30	.645	.706	.597	.109	80.2	87.2	74.1	13.1

The Mean height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of April, 1863.*

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued).

Date.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Humidity, complete saturation being unity.
	°	°	°	°	Inches.	T. gr.	T. gr.	
1	77.5	7.5	72.2	12.8	.0781	8.33	4.20	.067
2	75.3	8.5	69.3	14.5	.711	7.60	.50	.63
3	77.1	7.6	71.8	12.9	.771	8.23	.19	.66
4	78.9	7.1	73.9	12.1	.824	.79	.12	.68
5	<i>Sunday.</i>							
6	76.8	10.5	70.5	16.8	.739	7.85	5.56	.59
7	79.3	7.8	74.6	12.5	.843	8.96	4.37	.67
8	76.8	6.3	72.4	10.7	.785	.41	3.45	.71
9	78.0	6.0	73.8	10.2	.822	.80	.37	.72
10	78.8	6.2	74.5	10.5	.840	.98	.55	.72
11	78.4	6.1	74.1	10.4	.830	.89	.46	.72
12	<i>Sunday.</i>							
13	76.8	6.6	72.2	11.2	.781	.36	.60	.70
14	78.7	5.8	74.6	9.9	.843	9.02	.33	.73
15	78.5	6.2	74.2	10.5	.832	8.89	.53	.72
16	75.4	5.4	71.6	9.2	.766	.25	2.82	.75
17	77.9	5.6	74.0	9.5	.827	.86	3.14	.74
18	79.1	4.9	75.7	8.3	.873	9.36	2.81	.77
19	<i>Sunday.</i>							
20	76.6	6.1	72.3	10.4	.783	8.41	3.31	.72
21	77.7	7.1	72.7	12.1	.792	.47	.99	.68
22	78.1	7.1	73.1	12.1	.803	.58	4.03	.68
23	78.3	7.0	73.4	11.9	.811	.66	3.98	.69
24	78.4	7.5	73.1	12.8	.803	.56	4.31	.67
25	75.8	7.3	70.7	12.4	.744	7.98	3.88	.67
26	<i>Sunday.</i>							
27	77.2	7.3	72.1	12.4	.778	8.33	4.02	.67
28	76.5	10.0	70.5	16.0	.739	7.87	5.23	.60
29	77.0	7.2	72.0	12.2	.776	8.30	3.94	.68
30	74.6	5.6	70.7	9.5	.744	.02	2.86	.74

All the Hygrometrical elements are computed by the Greenwich Constants.

From the 1st January, 1863, the Greenwich New Factors have been used for computing Dew-point.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of April, 1863.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid- night.	29.717	29.798	29.579	0.219	79.3	82.4	74.4	8.0
1	.704	.786	.571	.215	79.3	82.9	74.4	8.5
2	.695	.776	.566	.210	78.8	82.0	74.2	7.8
3	.688	.773	.561	.212	78.5	81.6	74.0	7.6
4	.684	.782	.551	.231	78.7	81.4	74.3	7.1
5	.715	.793	.606	.187	78.2	80.8	73.0	7.8
6	.716	.804	.589	.215	78.3	81.0	72.8	8.2
7	.733	.820	.595	.225	79.2	82.2	74.2	8.0
8	.764	.838	.607	.231	82.4	86.2	76.8	9.4
9	.775	.842	.620	.222	85.2	88.8	77.0	11.8
10	.769	.849	.645	.204	87.7	90.8	78.8	12.0
11	.756	.831	.625	.206	90.0	93.6	78.6	15.0
Noon.	.738	.815	.599	.216	91.5	95.6	81.6	14.0
1	.708	.781	.580	.201	92.7	97.0	83.8	13.2
2	.680	.761	.556	.205	93.1	97.6	85.4	12.2
3	.655	.734	.523	.211	93.0	99.2	86.6	12.6
4	.634	.720	.507	.213	91.5	99.8	86.8	13.0
5	.635	.719	.506	.213	89.4	96.7	85.2	11.5
6	.644	.745	.506	.239	86.1	92.0	69.8	22.2
7	.666	.788	.525	.263	84.1	89.6	72.4	17.2
8	.684	.763	.533	.230	82.5	89.0	74.4	14.6
9	.709	.832	.543	.289	81.8	86.6	74.2	12.4
10	.721	.823	.573	.250	80.9	84.0	75.6	8.4
11	.721	.818	.594	.224	79.9	83.6	74.6	9.0

The Mean Height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of April, 1863.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued).

Hour.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Va- pour in a Cubic foot of air.	Additional Weight of Vapour required for complete satu- ration.	Mean degree of Hu- midity, complete saturation being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid- night.	75.4	3.9	72.7	6.6	0.792	8.56	2.03	0.81
1	75.4	3.9	72.7	6.6	.792	.56	.03	.81
2	75.4	3.4	73.0	5.8	.801	.65	1.79	.83
3	75.3	3.2	73.1	5.4	.803	.70	.65	.84
4	75.8	2.9	73.8	4.9	.822	.89	.52	.85
5	75.5	2.7	73.6	4.6	.817	.84	.41	.86
6	75.7	2.6	73.9	4.4	.824	.94	.34	.87
7	76.3	2.9	74.3	4.9	.835	9.03	.53	.86
8	77.9	4.5	74.7	7.7	.846	.08	2.53	.78
9	78.7	6.5	74.1	11.1	.830	8.87	3.74	.70
10	79.6	8.1	74.7	13.0	.846	.99	4.57	.66
11	80.2	9.8	74.3	15.7	.835	.83	5.67	.61
Noon.	80.5	11.0	73.9	17.6	.824	.69	6.46	.57
1	80.0	12.7	72.4	20.3	.785	.26	7.42	.53
2	80.1	13.0	72.3	20.8	.783	.22	.64	.52
3	80.1	12.9	72.4	20.6	.785	.24	.57	.52
4	79.3	12.2	72.0	19.5	.776	.16	6.99	.54
5	78.7	10.7	72.3	17.1	.783	.29	5.96	.58
6	77.4	8.7	71.3	14.8	.758	.08	4.87	.62
7	76.6	7.5	71.3	12.8	.758	.11	.10	.66
8	76.2	6.3	71.8	10.7	.771	.26	3.38	.71
9	76.2	5.6	72.3	9.5	.783	.41	2.99	.74
10	75.7	5.2	72.1	8.8	.778	.38	.72	.76
11	75.5	4.4	72.4	7.5	.785	.46	.32	.79

All the Hygrometrical elements are computed by the Greenwich Constants.
From the 1st January, 1863, the Greenwich New Factors have been used
for Computing Dew-point.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of April, 1863.*

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	°	Inches		
1	128.0	...	S.	Cloudless till 3 A. M. Scatd. clouds afterwards; also slightly drizzling at 5 P. M.
2	131.8	...	S. & E.	Cloudy till 6 A. M. Scatd. ∩i & ∪i till 2 P. M. cloudy till 7 P. M. cloudless afterwards; also slightly drizzling at 7 P. M.
3	135.0	...	S.	Cloudless till 5 P. M. Scatd. ∩i afterwards.
4	133.0	...	S.	Cloudless till 3 P. M. Scatd. clouds afterwards.
5	...	...	<i>Sunday.</i>	
6	137.0	...	S. & S. E. & W.	Scatd. ∩i till 9 A. M. cloudless afterwards.
7	132.0	...	S.	Cloudy till 6 A. M. Scatd. ∩i till 10 A. M. cloudless afterwards.
8	129.6	0.58	S.	Cloudless till 6 A. M. Scatd. ∪i till 4 P. M. cloudy afterwards; also thundering, lightning, hailing & raining at 6 P. M.
9	130.0	...	S.	Scatd. ∩i till 5 P. M. cloudy till 9 P. M. cloudless afterwards; also slightly drizzling between 8 & 9 P. M.
10	126.0	...	S. & S. E.	Cloudless till 3 A. M. Scatd. ∩i & ∪i till 4 P. M. cloudy till 9 P. M. cloudless afterwards.
11	126.2	...	S.	Cloudless till 2 A. M. Scatd. ∩i & ∪i till 6 P. M. cloudy afterwards; also flashes of lightning between 7 & 9 P. M.
12	...	...	<i>Sunday.</i>	
13	129.0	...	S. & S. W.	Cloudless till 7 A. M. Scatd. clouds till 4 P. M. cloudy afterwards; also thunder & lightning between 6 & 9 P. M.
14	123.0	...	S. & E.	Scatd. clouds till 6 A. M. Scatd. ∩i till 3 P. M. cloudy afterwards; also raining between 4 & 5 A. M.
15	127.0	0.29	S. & E.	Cloudy till 8 A. M. Scatd. ∩i & ∪i till 5 P. M. cloudy afterwards; also thundering, lightning & raining at 10 & 11 P. M.
16	126.5	...	S.	Cloudy till 9 A. M. Scatd. ∩i till 4 P. M. cloudless afterwards.
17	128.0	0.39	S. & W.	Scatd. ∩i till 4 P. M. cloudy afterwards; also thundering & lightning between 6 & 10 P. M.; also raining at 7 A. M. & 6 P. M.
18	130.0	...	S. & S. W.	Scatd. clouds.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of April, 1863.*

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	°	Inches.		
19	...	0.78	<i>Sunday.</i>	
20	135.0	...	S.	Cloudy till 7 A. M. Scatd. ☉ & ☾ till 7 P. M. cloudless afterwards.
21	138.0	...	S. & S. E.	Cloudless.
22	134.0	...	S.	Cloudless.
23	132.0	...	S. E. & S.	Cloudless.
24	131.2	...	S. & S. W.	Scatd. ☉ & ☾ till 3 P. M. cloudy afterwards; also thundering & drizzling at 4 P. M.
25	133.0	...	S. & S. E.	Cloudy till Noon. Scatd. ☾ & ☾ till 8 P. M. cloudless afterwards.
26	...	...	<i>Sunday.</i>	
27	137.0	...	S.	Cloudless till 1 P. M. Scatd. ☉ till 5 P. M. cloudless afterwards.
28	130.0	...	S.	Cloudless till 4 P. M. Scatd. ☾ afterwards.
29	129.6	...	S. & S. E. & N. W.	Scatd. ☉ & ☾ till 3 P. M. cloudy afterwards.
30	127.0	0.39	E. & S. E.	Cloudy till 10 A. M. cloudless afterwards; also raining at Midnight, 1 A. M. & Noon.

☾ Cirri, ☾ Cirro strati, ☉ Cumuli, ☾ Cumulo strati, ☾ Nimbi, —i Strati, ☾ Cirro cumuli.

*Abstract of the Results of the Hourly Meteorological Observations
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in the month of April, 1863.*

MONTHLY RESULTS.

			Inches
Mean height of the Barometer for the month,	29.705
Max. height of the Barometer occurred at 10 A. M. on the 21st,	..	..	29.849
Min. height of the Barometer occurred at 5 & 6 P. M. on the 4th & 7th,	..	..	29.506
Extreme range of the Barometer during the month,	..	..	0.343
Mean of the daily Max. Pressures,	..	..	29.777
Ditto ditto Min. ditto,	..	..	29.622
Mean daily range of the Barometer during the month,	..	..	0.155

			o
Mean Dry Bulb Thermometer for the month,	..	..	84.4
Max. Temperature occurred at 4 P. M. on the 6th,	..	..	99.8
Min. Temperature occurred at 6 P. M. on the 8th,	..	..	69.8
Extreme range of the Temperature during the month,	..	..	30.0
Mean of the daily Max. Temperature,	..	..	93.6
Ditto ditto Min. ditto,	..	..	76.6
Mean daily range of the Temperature during the month,	..	..	17.0

			o
Mean Wet Bulb Thermometer for the month,	..	..	77.4
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	..	..	7.0
Computed Mean Dew-point for the month,	..	..	72.5
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	..	..	11.9
			Inches
Mean Elastic force of Vapour for the month, ..	..	..	0.787

			Troy grains
Mean Weight of Vapour for the month, ..	..	..	8.42
Additional Weight of Vapour required for complete saturation, ..	..	..	3.89
Mean degree of humidity for the month, complete saturation being unity,	..	..	0.68

			Inches
Rained 10 days, Max. fall of rain during 24 hours,	0.78
Total amount of rain during the month,	2.43
Prevailing direction of the Wind,	S.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of April, 1863.*

MONTHLY RESULTS.

Table showing the number of days on which at a given hour any particular wind
blew, together with the number of days on which at the same hour,
when any particular wind was blowing, it rained.

Hour.	N.	Rain on. N. E.	Rain on. E.	Rain on. S. E.	Rain on. S.	Rain on. S. W.	Rain on. W.	Rain on. N. W.	Rain on. Calm.	Rain on. Missed.
	No. of days.									
Midnight.			4	7	1	12				3
1			4	5	1	16				1
2			5	4		17				
3			4	5		16				1
4			4	5		12			1	4
5			4	6	1	11			1	4
6			2	8		16				
7			5	8		13	1			
8			2	4		15		2	1	2
9				4		19		2		1
10				3		18		5		
11		1		4		17		3	1	
Noon.			1			19		6		
1			1	2		20		2	1	
2			1	2		16		6	1	
3			1	1		18		5	1	
4			1	4		15		5	1	
5				3		20		1		1
6		1	1	2		19		1	2	1
7		1		3		20	1	1	1	
8		1		2		19		1	1	1
9		1	1	3		19	1	1	1	
10	1	1	2	5		15		1	1	1
11			3	4		15		2	2	

*Abstract of the Results of the Hourly Meteorological Observations
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in the month of May, 1863.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the Sea-level, ^{Feet.} 18.11

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
1	29.647	29.712	29.538	0.174	85.9	96.8	76.6	20.2
2	.643	.706	.543	.163	87.4	95.4	80.4	15.0
3	<i>Sunday.</i>							
4	.670	.714	.601	.113	79.4	92.1	74.6	17.5
5	.689	.743	.622	.121	81.5	90.4	75.0	15.4
6	.704	.757	.640	.117	77.6	85.6	74.6	11.0
7	.722	.798	.659	.139	81.0	87.5	74.0	13.5
8	.631	.708	.555	.153	80.8	84.4	75.4	9.0
9	.624	.683	.574	.109	83.7	92.7	75.6	17.1
10	<i>Sunday.</i>							
11	.654	.717	.575	.142	87.0	93.2	82.0	11.2
12	.631	.720	.549	.171	86.7	93.6	82.2	11.4
13	.657	.724	.595	.129	85.3	92.6	76.7	15.9
14	.664	.727	.597	.130	85.8	93.6	78.7	14.9
15	.656	.715	.583	.132	87.6	94.9	82.2	12.7
16	.677	.736	.606	.130	86.5	93.8	81.8	12.0
17	<i>Sunday.</i>							
18	.630	.722	.551	.171	87.8	94.8	80.4	14.4
19	.601	.675	.522	.153	86.4	95.0	79.0	16.0
20	.551	.620	.455	.165	86.8	98.0	74.6	23.4
21	.574	.691	.513	.178	83.9	92.4	77.0	15.4
22	.614	.707	.517	.190	85.1	94.6	76.3	18.3
23	.656	.745	.564	.181	86.2	94.6	78.8	15.8
24	<i>Sunday.</i>							
25	.666	.722	.582	.140	87.1	97.0	79.4	17.6
26	.615	.672	.523	.149	88.2	97.6	79.2	18.4
27	.574	.654	.491	.163	90.0	100.4	83.6	16.8
28	.535	.600	.450	.150	90.0	100.6	83.1	17.5
29	.499	.560	.414	.146	90.5	104.0	83.2	20.8
30	.470	.523	.373	.150	91.4	101.4	84.8	16.6
31	<i>Sunday.</i>							

The Mean Height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the twenty-four hourly Observations made during the day.

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taken at the Surveyor General's Office, Calcutta,
in the month of May, 1863.*

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued).

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of air.	Additional Weight of Va- pour required for com- plete saturation.	Mean degree of Humi- dity, complete satura- tion being unity.
	°	°	°	°	Inches.	T. gr.	T. gr.	
1	79.0	6.9	74.2	11.7	.0832	8.87	4.00	0.69
2	81.0	6.4	77.2	10.2	.916	9.75	3.70	.73
3	<i>Sunday.</i>							
4	74.8	4.6	71.6	7.8	.766	8.27	2.35	.78
5	77.1	4.4	74.0	7.5	.827	.90	.41	.79
6	74.4	3.2	72.2	5.4	.781	.46	1.61	.84
7	76.5	4.5	73.3	7.7	.809	.70	2.44	.78
8	77.7	3.1	75.5	5.3	.868	9.37	1.70	.85
9	78.8	4.9	75.4	8.3	.865	.28	2.79	.77
10	<i>Sunday.</i>							
11	81.2	5.8	77.7	9.3	.931	.92	3.37	.75
12	80.1	6.6	76.1	10.6	.885	.42	.76	.72
13	77.9	7.4	72.7	12.6	.792	8.45	4.19	.67
14	79.1	6.7	74.4	11.4	.838	.95	3.88	.70
15	80.0	7.6	75.4	12.2	.865	9.20	4.32	.68
16	80.0	6.5	76.1	10.4	.885	.44	3.66	.72
17	<i>Sunday.</i>							
18	80.1	7.7	75.5	12.3	.868	.23	4.37	.63
19	79.4	7.0	74.5	11.9	.840	8.96	.10	.69
20	80.1	6.7	76.1	10.7	.885	9.42	3.79	.71
21	78.3	5.6	74.4	9.5	.838	8.97	.16	.74
22	79.1	6.0	74.9	10.2	.851	9.09	.48	.72
23	78.9	7.3	73.8	12.4	.822	8.76	4.23	.67
24	<i>Sunday.</i>							
25	80.5	6.6	76.5	10.6	.896	9.54	3.79	.72
26	81.6	6.6	77.6	10.6	.928	.85	.91	.72
27	82.6	7.4	78.2	11.8	.946	10.00	4.50	.69
28	81.9	8.1	77.0	13.0	.910	9.63	.87	.66
29	80.2	10.3	74.0	16.5	.827	8.73	5.99	.59
30	80.9	10.5	74.6	16.8	.843	.89	6.21	.59
31	<i>Sunday.</i>							

All the Hygrometrical elements are computed by the Greenwich Constants.
From the 1st January, 1863, the Greenwich New Factors have been used for
Computing Dew-point.

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in the month of May, 1863.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	o	o	o	o
Mid- night.	29.635	29.722	29.509	0.213	80.8	86.2	75.0	11.2
1	.630	.717	.491	.226	80.7	86.0	75.0	11.0
2	.617	.709	.485	.224	80.6	85.2	74.6	10.6
3	.612	.707	.481	.226	80.4	85.2	74.4	10.8
4	.610	.708	.489	.219	80.9	85.2	74.2	11.0
5	.627	.735	.491	.244	80.2	85.2	74.0	11.2
6	.643	.747	.495	.252	80.3	85.6	74.2	11.4
7	.657	.757	.508	.249	81.8	87.4	75.6	11.8
8	.674	.784	.523	.261	85.0	90.6	80.4	10.2
9	.683	.785	.523	.262	87.3	92.6	80.0	12.6
10	.682	.798	.521	.277	89.9	95.4	84.4	11.0
11	.669	.782	.511	.271	91.5	97.8	78.9	18.9
Noon.	.649	.762	.495	.267	92.2	99.8	77.2	22.6
1	.622	.738	.462	.276	93.1	101.4	75.4	26.0
2	.597	.698	.434	.264	92.9	102.4	76.6	25.8
3	.576	.681	.406	.275	92.7	103.6	75.8	27.8
4	.559	.676	.373	.303	91.6	104.0	74.8	29.2
5	.552	.661	.376	.285	90.2	99.6	75.0	24.6
6	.565	.669	.381	.288	87.6	95.0	74.9	20.1
7	.592	.683	.397	.286	85.3	94.1	74.6	19.5
8	.623	.707	.446	.261	83.6	88.4	74.6	13.8
9	.637	.723	.470	.253	82.8	87.0	74.8	12.2
10	.639	.728	.483	.245	82.5	86.4	75.0	11.4
11	.643	.728	.474	.254	81.9	86.6	74.6	12.0

The Mean Height of the Barometer, as likewise the Mean Dry and Wet Bulb Thermometers are derived from the Observations made at the several hours during the month.

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taken at the Surveyor General's Office, Calcutta,
in the month of May, 1863.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.—(Continued.)

Hour.	Mean Wet Bulb Thermometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Va- pour in a Cubic foot of air.	Additional Weight of Vapour required for complete saturation.	Mean degree of Hu- midity, complete satu- ration being unity.
	o	o	o	o	Inches.	Troy grs.	Troy grs.	
Mid- night.	77.0	3.8	74.3	6.5	.0835	8.99	2.08	0.81
1	76.8	3.9	74.1	6.6	.830	.94	.10	.81
2	76.9	3.7	74.3	6.3	.835	9.01	.00	.82
3	77.1	3.3	74.8	5.6	.849	.15	1.79	.84
4	77.8	3.1	75.6	5.3	.871	.39	.71	.85
5	77.4	2.8	75.4	4.8	.865	.34	.54	.86
6	77.5	2.8	75.5	4.8	.868	.37	.54	.86
7	78.6	3.2	76.4	5.4	.893	.62	.78	.84
8	80.1	4.9	76.7	8.3	.902	.64	2.89	.77
9	80.8	6.5	76.9	10.4	.908	.66	3.75	.72
10	81.7	8.2	76.8	13.1	.905	.57	4.89	.66
11	82.0	9.5	76.3	15.2	.890	.40	5.75	.62
Noon.	81.8	10.4	75.6	16.6	.871	.16	6.29	.59
1	82.0	11.1	75.3	17.8	.862	.06	.80	.57
2	81.4	11.5	74.5	18.4	.840	8.85	.92	.56
3	81.1	11.6	74.1	18.6	.830	.73	.95	.56
4	80.9	10.7	74.5	17.1	.810	.87	.32	.53
5	80.9	9.3	75.3	14.9	.862	9.12	5.47	.63
6	79.6	8.0	74.8	12.8	.849	.02	4.50	.67
7	78.7	6.6	74.1	11.2	.830	8.87	3.77	.70
8	77.9	5.7	73.9	9.7	.824	.83	.20	.73
9	77.9	4.9	74.5	8.3	.810	9.03	2.72	.77
10	78.2	4.3	75.2	7.3	.860	.24	.40	.79
11	77.7	4.2	74.8	7.1	.849	.13	.31	.80

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Computing Dew-point.

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in the month of May, 1863.*

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches		
1	135.0	...	S. & W.	Cloudless.
2	123.0	...	S. & S. E.	Cloudless till 6 P. M. cloudy afterwards.
3	...	...	Sunday.	
4	...	0.32	E. & S. & S. E.	Scatd. \-i & \-i till Noon; cloudy afterwards; also raining at 2 P. M.
5	130.0	...	N. E. & S. E.	Scatd. clouds till 7 P. M. cloudless afterwards; also slightly drizzling between 8 & 9 A. M.
6	...	0.22	E.	Cloudless till 4 A. M. cloudy afterwards; also drizzling at 11 A. M. & Noon & from 3 to 5 P. M.
7	117.0	...	E. & S. E. & S.	Scatd. clouds till 6 P. M. cloudless afterwards.
8	...	1.25	S.	Cloudy; and thundering from 10 A. M. to 1 P. M. and at 8 & 9 P. M. also raining between 8 & 9 and 10 & 11 A. M. and drizzling from 9 to 11 P. M.
9	130.0	...	S.	Cloudy till 9 A. M. Scatd. \-i afterwards.
10	...	...	Sunday.	
11	125.8	...	S.	Cloudless till 3 A. M. Scatd. clouds till 2 P. M. cloudless afterwards.
12	130.0	...	S. & S. E.	Cloudless till 3 A. M. Scatd. \-i till 5 P. M. cloudy afterwards.
13	127.0	...	S. & E.	Cloudy till 4 A. M. Scatd. \-i & \-i till 2 P. M. cloudless till 8 P. M. cloudy afterwards; also drizzling at 4 A. M. 10 & 11 P. M.
14	132.0	...	S. & S. W.	Scatd. clouds till 10 A. M. Scatd. \-i & \-i afterwards.
15	131.0	...	S.	Cloudy till 5 A. M. Scatd. \-i till 11 A. M. Scatd. \-i till 7 P. M. cloudy & lightning afterwards; also slightly drizzling between 9 & 10 P. M.
16	131.0	...	S. & S. E.	Cloudless till 7 A. M. Scatd. clouds till 8 P. M. cloudless afterwards; also slightly drizzling between 2 & 3 P. M.
17	...	...	Sunday.	
18	126.4	...	S.	Cloudless till 7 A. M. Scatd. \-i till 3 P. M. cloudy afterwards, also slightly drizzling at 9 P. M.
19	130.4	...	S. & S. E.	Cloudy till 6 A. M. Scatd. \-i & \-i till 6 P. M. cloudless afterwards.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of May, 1863.*

Solar Radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain Gauge 5 feet above Ground.	Prevailing direction of the Wind.	General Aspect of the Sky.
20	132.0	1.55	S. E. & S.	Cloudless till 8 A. M. Scatd. \searrow i & \nearrow i till 6 P. M. cloudy with thunder and lightning afterwards; also raining at 7 & 8 P. M.
21	...	0.14	S. & E.	Cloudy; also drizzling at 11 P. M.
22	124.0	...	S. E. & S. & E.	Cloudless till 6 A. M. Scatd. \nearrow i till 3 P. M. cloudless till 6 P. M. cloudy afterwards; also very slightly drizzling at 8 P. M.
23	130.5	...	E. & S.	Scatd. clouds till 3 P. M. Scatd. \searrow i afterwards.
24	...	...	Sunday.	
25	134.0	0.72	S. & Calm.	Cloudless till 7 A. M. Scatd. \searrow i & \nearrow i till 5 P. M. cloudy afterwards; also raining between 7 & 8 P. M.
26	134.0	...	S. & S. E. & S. W.	Cloudy till 5 A. M. Scatd. \searrow i till Noon; Scatd. \nearrow i afterwards.
27	130.4	...	S.	Scatd. clouds.
28	132.0	...	S. & E.	Scatd. \searrow i & \searrow i till 6 P. M. cloudless afterwards.
29	142.0	...	E. & S. & S. E.	Cloudy till 7 A. M. Scatd. \searrow i & \searrow i till 4 P. M. cloudy afterwards.
30	135.0	...	S. E. & S.	Scatd. \searrow i till 2 P. M. cloudy afterwards; also slightly drizzling at 3 P. M.
31	...	...	Sunday.	

\searrow i Cirri, \searrow i Cirro strati, \nearrow i Cumuli, \nearrow i Cumulo strati, \searrow i Nimbi,—i Strati
 \searrow i Cirro cumuli.

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in the month of May, 1863.*

MONTHLY RESULTS.

			Inches
Mean height of the Barometer for the month,	29.625
Max. height of the Barometer occurred at 10 A. M. on the 7th,	..	..	29.798
Min. height of the Barometer occurred at 4 P. M. on the 30th,	..	..	29.373
<i>Extreme range</i> of the Barometer during the month, ..	..	..	0.425
Mean of the Daily Max. Pressures, .	..	..	29.694
Ditto ditto Min. ditto, ..	..	..	29.546
<i>Mean daily range</i> of the Barometer during the month, ..	..	..	0.148

			°
Mean Dry Bulb Thermometer for the month, ..	..	..	85.8
Max. Temperature occurred at 4 P. M. on the 29th,	..	..	104.0
Min. Temperature occurred at 5 A. M. on the 7th,	..	..	74.0
<i>Extreme range</i> of the Temperature during the month, ..	..	..	30.0
Mean of the daily Max. Temperature, ..	..	..	94.5
Ditto ditto Min. ditto, ..	..	..	78.8
<i>Mean daily range</i> of the Temperature during the month, ..	..	..	15.7
Mean Wet Bulb Thermometer for the month, ..	..	..	79.3
Mean Dry Bulb Thermometer above Mean Wet Bulb Thermometer, ..	..	..	6.5
Computed Mean Dew-point for the month, ..	..	..	74.7
Mean Dry Bulb Thermometer above computed Mean Dew-point, ..	..	..	11.1

			Inches
Mean Elastic force of Vapour for the month, ..	..	..	0.846

			Troy grains
Mean Weight of Vapour for the month, ..	..	..	9.03
Additional Weight of Vapour required for complete saturation, ..	..	..	3.80
Mean degree of humidity for the month, complete saturation being unity, ..	..	..	0.70

			Inches
Rained 13 days, Max. fall of rain during 24 hours, ..	..	..	1.55
Total amount of rain during the month, ..	..	..	4.20
Prevailing direction of the Wind, ..	..	..	S. & S. E.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of May, 1863.*

MONTHLY RESULTS.

Table showing the number of days on which at a given hour any particular wind blew, together with the number of days on which at the same hour, when any particular wind was blowing, it rained.

Hour.	N.	Rain on. N. E.	Rain on. E.	Rain on. S. E.	Rain on. S.	Rain on. S. W.	Rain on. W.	Rain on. N. W.	Rain on. Calm.	Rain on.	Missed.
	No. of days.										
Midnight.											
1				6	6	9		1		1	3
2				5	6	10	1	1		2	1
3				6	6	11		1		1	1
4				6	5	11		1		2	
5				4	1 3	11	1	1		1	5
6				3	5	11	1	3		1	2
7		1		5	5	11		3			1
8		2		4	3	14	1	2			
9				5	4	14	3				
10		1	1	3	3	14	1 5				
11	1	1		3	3	15	4				
				1	4 1	16	1 2	2			
Noon.											
1				2	6 1	12	4	2			
2				1	5	13	4	3			
3				1	5	11	6	1	2	1	
4				2	1 7	11	1 4	1	1		
5	1	1		2	8	9	3				2
6			1	1	3	20	1 1				
7			1	3	5	16	1				
8	2	1	1	4	4	15					
9	2	2	1	4	5	11					
10	1	1		6	3	13	2	1	1	1	1
11	1	1		7	3	12	3		2		2
	1	1		7	1 3	12	2 1				1

